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TWO NEW SPECIES OF *DENNYUS* (MALLOPHAGA)
FROM PALM SWIFTS

by

GORDON B. THOMPSON

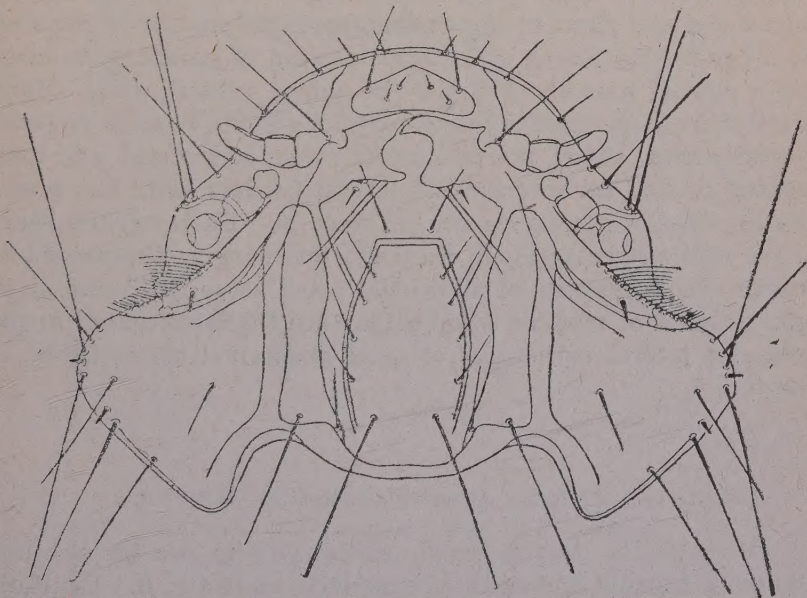
(Assitant Curator, Science Museum, Institute of Jamaica,
Kingston, Jamaica, B. W. I.)

1. *Dennyus gossei* sp. n.

Type host.—*Tachornis phoenicobia* Gosse.

Specimens examined.—Female holotype, male allotype off
type host, B. W. I., Jamaica, St. Andrew, Long Mtn, Rifle range,
13. iii. 1947 (H. B. Tordoff).

Brief description.—A medium sized, moderately robust, well
sclerotised and pigmented form.



1. Head of *Dennyus gossei* sp. n. — female

Female.—(t.—figs. 1, 2, 3, 4, 5, 9).

Length.—2.34 mm.; *greatest breadth*.—0.81 mm.

Head.—roughly triangular in shape and a third wider than long. (see fig. 1,9).

Prothorax slightly broader than long with slightwings on either side each bearing two spines and a longish seta. Six longish setae widely separated along posterior margin. Prosternal plate as in fig. 4.

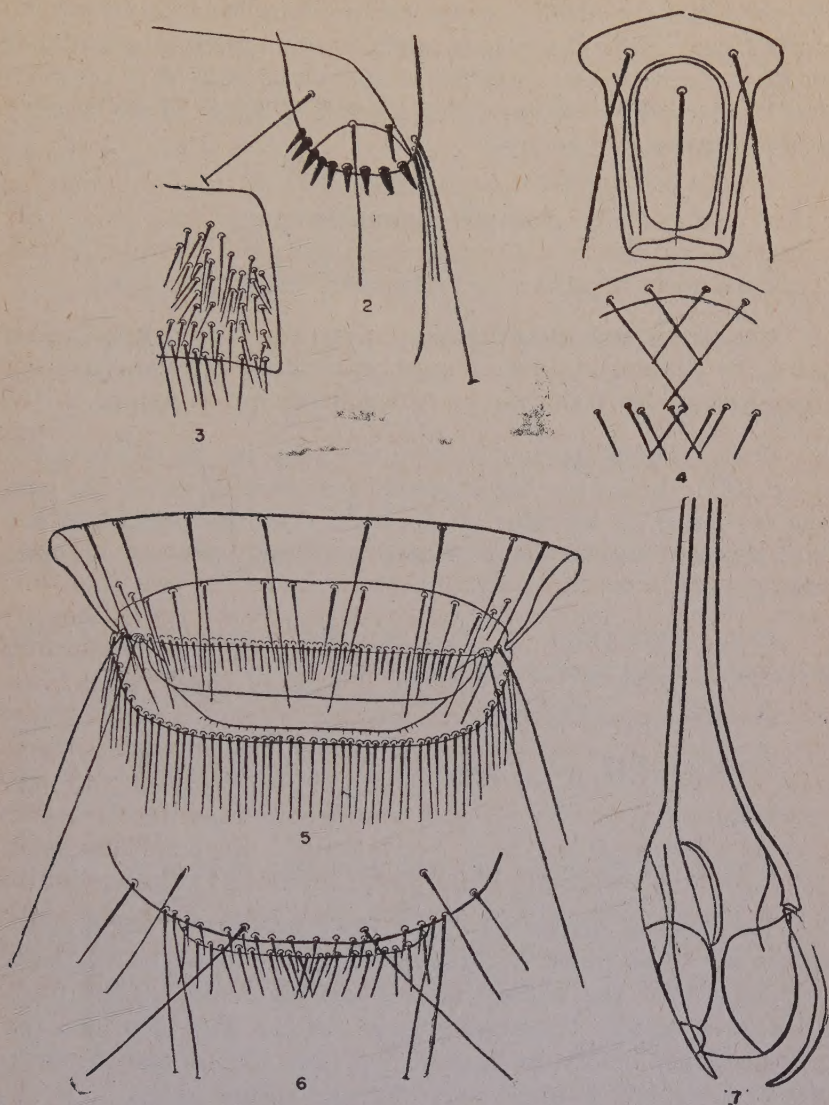
esothorax and metathorax almost equal in length, separated by distinct suture. Metathorax with transverse row of longish setae on posterior margin and with two spines in the postero-lateral angles. Legs characteristic of the genus with anterior femora flattened and large, posterior femora with patch of medium sized setae.

Abdomen.—rectangular with no great expansion midway. Segments each bearing a single transverse row of two short and one moderately long setae alternately. Paratergites heavily sclerotised and pigmented, overlapping, separated from sternites by a narrow clear area. Posterior margin of paratergites bearing a row of nine short thorn-like spines (see fig. 2). There are two medium sized and one very long setae in each postero-lateral angle. First sternite short, well sclerotised and pigmented around its anterior and lateral borders, with the posterior angles overlapping the second sternite. Each sternite bears a row of short setae along its posterior margin; the second to fourth with a number of additional small setae, fifth and sixth with patches of medium sized setae (see fig. 3) situated in the posterior lateral corners. Terminal abdominal segments as in fig. 5.

Male.

Length.—1.98 mm.; *greatest breadth*.—0.58 mm.

Very similar to the female except for its smaller size and the more tapered abdomen. Terminalia as in fig. 6. Genitalia of type common to many genera of Menoponidae—see fig. 7.



2. Paratergite of *Dennyus gossei* sp. n. — female.
3. Sternite V of *Dennyus gossei* sp. n. — female.
4. Sternal plates of *Dennyus gossei* sp. n. — female.
5. Terminalia of *Dennyus gossei* sp. n. — female.
6. Terminalia of *Dennyus gossei* sp. n. — male.
7. Male genitalia of *Dennyus gossei* sp. n.

The preputial sac which is beset with minute 'teeth' is not shown in the figure. The drawing is made from a specimen containing the genitalia within the abdominal cavity and I am of the opinion that the curved paramere, which gives it a degree of asymmetry is more apparent than real.

2. *Dennyus cypsiurus* sp. n.

... *Type host*.—*Cypsiurus parvus balasiensis* (J. E. Gray).

Specimens examined.—Female holotype, male allotype and one male paratype off type host, Ceylon, C. P., Gammaduwa, Mousakande, alt. 2,400 ft., 16. x. 1935 (W. W. A. Phillips).

Note. These specimens were recorded by me as *Dennyus* sp. in 1936 * and were found among feathers, of which the nest was composed, at the edge of the nest. The nest contained one fresh egg and was on the underside of the leaf of a tall coconut-palm.

Brief description.—A medium sized, moderately robust, sclerotised and pigmented form.

Female.—(t.—fig. 8).

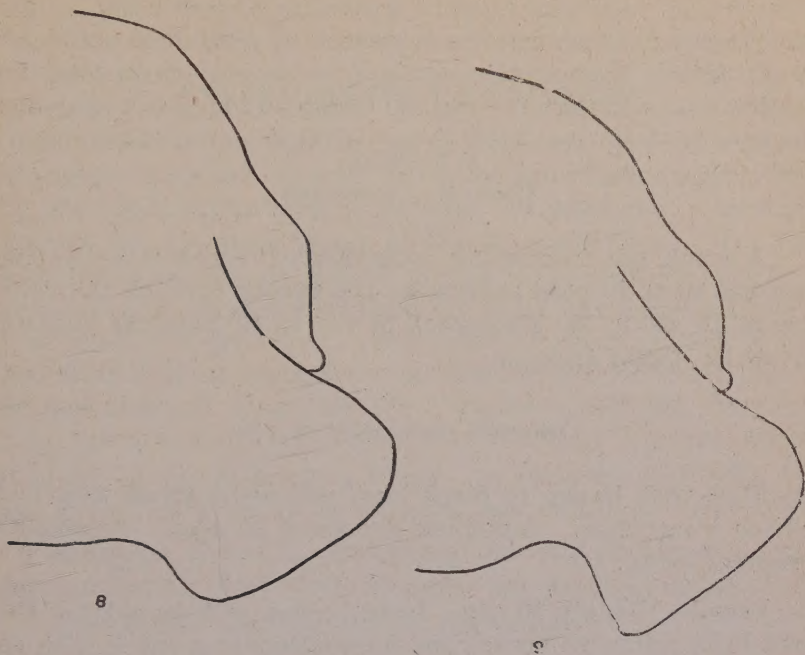
Length.—2.47 mm.; *greatest breadth*.—0.93 mm.

Male.

Length.—1.96 mm.; *greatest breadth*.—0.68 mm.

This species comes very close to *gossei* sp. n. The differences are to be found in its larger size, the shape of the head (see figs. 8,9); the less sclerotised and pigmented paratergites with much smaller thornlike spines. In the male genitalia the parameres are much less curved (see note above) and the male terminal segment is much narrower and rather longer.

* Thompson, 1936, Ent. mon. Mag., lxxii, p. 95.



8. Outline of head of *Dennyus gossei* sp. n. — female.
9. Outline of head of *Dennyus cypsiurus* sp. n. — female.

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VENEZUELAN SYRPHID FLIES

F. M. HULL
University, Mississippi

A small but interesting collection of Venezuelan Syrphid flies has recently been studied by the author through the courtesy of Dr. C. F. W. Muesebeck of the U. S. National Museum and of Dr. Pablo Anduze.

Volucella cupricolor, n. sp.

Flies with brown to black legs, yellow trivittate face and reddish mesonotum. Scutellum depressed at apex. Related to *roraima* Curran.

Female. Length 10 mm. *Head*: vertex and the sides of the front light yellowish brown, the interocellar area black with an obscure brown line down the middle of the front and down each of the lateral grooves. The preantennal callus is black, the antennae entirely orange brown, the apical half of the arista blackish; the arista has twenty-nine black dorsal rays. The face is unusually deep and sharply conical and is light creamy brown and shining with a broad medial and almost equally broad lateral stripe; cheeks honey brown. Pile of eyes light yellowish brown, sparse, confined to upper two-thirds and absent behind. *Thorax*: mesonotum light chestnut red without well defined vittae but becoming light yellowish brown laterally upon the margin and still lighter upon the upper part of the pleura. The sternopleura, hypopleura and narrow anterior portion of the mesopleura are brownish red; propleura yellowish. Pleural pile entirely yellow; all the bristles of the thorax including two upon notopleura, three over the wing, three on post calli and one upon mesopleura black. Dorsal pile chiefly pale yellow. Scutellum concolorous with thorax and like it with a slight bluish opalescent tinge, its extreme margin yellow with three pairs of black

bristles, the posterior pair very widely separated. The depression of the scutellum is transverse and granulate in appearance. The base of the scutellum is without granulated areas. Squamae dark brown with similar fringe. The halteres are creamy white. *Abdomen* subcircular, quite flattened, the first segment and upon the second segment the basal two-thirds medially and the basal half laterally quite hyaline but yellowish. The third segment has on either side a crescentic basal fascia. The pile of the abdomen along the sides is yellowish; upon the disc it is appressed and black except upon the basal hyaline areas where it is yellow. *Legs*: the femora are very dark reddish sepia; their tibia still darker and the tarsi black and all of the pile of the legs is black except for the brownish under-pile restricted to the lower surface of the hind tarsi. *Wings*: yellowish brown with the apex a little more brown, the base and especially the area immediately behind the stigmal cell a little more yellowish.

Holotype: a female, Venezuela, V—16—42 (René Lichy) Holotype in the U. S. Natl. Museum; one paratype female with the same date in the collection of the author.

Planes chlorops n. sp.

A brassy black species with marked greenish reflections upon the fourth abdominal segment. The hind femora is very greatly thickened and the first three tarsal segments of the first four tarsi are light orange. Related to *puma* Curran.

Male. Length 9 mm. *Head*: vertex brassy black but copery upon the highest part of the occiput; the upper occipital pile is yellow with seven or eight short, stout black spines. The pubescence between the ocelli is reddish brown and very short but thick; it is light yellowish upon the vertical triangle of the front. The front is brassy black and bare except immediately below the junction of the eyes; its pile yellow. The first two segments of the antennae are sepia; third missing. Face blackish on the upper half, yellowish brown upon the lower half becoming reddish along the epistomal margin. The pubescence of the face is pale brownish yellow. The cheeks are black. *Torax*: black with a faint greenish cast and suggestions of four

very faint, slightly coppery vittae. The light brassy pile is arranged in two broad stripes, one on either side, between which is a narrow, medial stripe; the outer stripes are connected with a transverse band of pile along the transverse suture which is medially quite attenuated but widening laterally and then proceeding posteriorly just above the base of the wings. The scutellum is greenish black with distinct, impressed rims, its pile brassy. *Abdomen*: of the usual type; the first segment bluish black and quite striate transversely; second segment brownish black with on either side an elongate, marginal, central, yellowish brown spot, the extreme lateral margin appears to be darker brown. The third segment has on either side a subbasal, shorter, lighter yellowish brown spot, its inner ends rounded, the segment opaque except laterally and on the posterior edge of the segment. The fourth segment is wholly shining greenish black, its pile yellow except for a few dark hairs in the middle of the basal half; the yellow pile is without special configuration but slightly directed towards the middle. Fourth sternite with a sharp-pinned, medial ridge on the basal two-thirds. *Legs*: the first four femora are sepia becoming darker apically but the apex is yellowish brown. The hind femora are very much thickened, and shining black, the apex is obscurely dark brown. The anterior tibiae are nearly black except their extreme apex and upon the basal fourth which is diffusely yellowish brown. The basal half of the middle tibiae is diffusely brownish yellow becoming slightly more brownish apically. The hind tibiae are sepia, their base narrowly light yellowish, their apex with a long sharp supr. First three segments of first four tarsi honey yellow; last two segments black; basal three segments of hind tarsi dark, the last segments black. *Wings*: pale greysih hyaline, stigma sepia.

Holotype: a male, San Esteban, Venezuela, XI 399 (Pablo Anduze). Holotype in the U. S. Natl. Museum.

Mesogramma Lutzi Curran var. *fasciata* n. var.

Female. Length 5 mm. *Head*: face widely shining black, the sides light yellow extending narrowly up along the front

which is black. Vertex metallic brassy, cheeks shining black, the black color extending very narrowly forward along the epistoma. Occiput greyish pollinose with a slight brassy cast below and a marker indentation in the middle of the eyes, vertical pile pale yellow. *Torax*: shining black with a narrow brassy linear medial vitta and with two sub-medial and two sublateral brassy vittae and the area before the scutellum strongly brassy. Humeri, the lateral margins in front of the suture, the notopleura, a prominent spot on the propleura, posterior half of the mesopleura, upper half of the sternopleura and the full posterior half and margins of the scutellum light yellow. Basal half of the scutellum with a semicircular black spot, the extreme base brassy. *Abdomen*: oval, the first segment shining black but narrowly yellow laterally, second segment shining black, the lateral margins not quite to the apex narrowly yellow; there is a small, lateral, central, shining reddish spot extending inward which is somewhat obscure. Third segment with the posterior half shining black and connected medially with a medial, basal, shining black triangle, the remainder of the segment on either side basally shining reddish brown. Fourth segment entirely similar to the fourth, the reddish areas are not very sharply marked off on these segments but are most clearly demarcated upon the third segment. *Legs*: anterior and middle femora and tibiae light brownish yellow, their tarsi pale brown, the apical segment scarcely darker. Base of hind femora and their coxae yellow and also the extreme apex of these femora light yellow, the intervening area sepia brown; extreme base and a broad middle band of their tibiae yellow, the remainder of their tibiae and the tarsi sepia brown. *Wings*: hyaline, the stigma light yellowish brown, the third vein almost straight, being very slightly convex apically. The subapical cross vein is very shallowly sinuous.

Holotype: female. San Esteban, Venezuela, 1—6—1940 (Anduze), Type in U. S. N. M.

Mesogramma alphabetica Hull, var. *flavopocula* n. var.

Male. Length about 6 mm. *Head*: face and front yellow, the cheeks black, the first two antennae segments orange, the

third segment missing. The vertex is quite narrow and violaceous, the upper occiput is not excluded or obscured by the eye, the median impression of the eye is deep but not sharp. The occipital pile is yellow above and below. *Thorax*: mesonotum black with rather wide but obscure, medial, greyish white vittae; the humeri and the lateral margins of the mesonotum are yellow throughout including the margin of the scutellum; the surface of the scutellum is sharply metallic black and transversely wrinkled. The propleura are black, the posterior mesopleura and upper sternopleura yellow; only the sternopleura are pubescent. *Abdomen*: elongate, the sides nearly parallel, the first segment is black except upon the sides laterally; the second is black with a median but oblique and somewhat diagonal, yellow fascia which is narrowly interrupted in the middle and is confluent with a short, posteriorly oblique extension just before it reaches the antero-lateral corners. Third segment with pattern similar to *alphabetica* Hull; the yellow of the medial crescentic vittae is broadly joined to the basal triangles but contains a tiny black dot. The medial spots of the fourth segment are well separated from the basal lateral yellow triangles. Fifth segment with a medial, rhomboidal black spot. *Legs*: first four legs yellow; hind femora yellow with quite wide black subapical bands, and subapically their tarsi dark brown, their tibiae dark brown subbasally and light brown in the middle. *Wings*: hyaline.

Female. Similar to the male, the third antennae segment reddish brown the sides of the front narrowly yellow, the pattern of the third and fourth segments similar to the male but the abdomen considerably wider. Fifth segment with a prominent, sublateral vittae in addition to the medial, rhomboidal spot.

Holotype: a male, San Esteban, Venezuela, XI, 39, Pablo Anduze. Allotype: a female with same data.

PHLEBOTOMES DU VENEZUELA.
SUR LA FEMELLE DE *P. CAYENNENSIS* FLOCH
ET ABONNENC, 1941

H. FLOCH et E. ABONNENC

Dans un lot de phlébotomes du Vénézuéla que nous a adressé le Dr. Pablo Anduze, nous avons trouvé des mâles de *P. cayennensis* Floch et Abonnenc 1941. 13 femelles qui les accompagnaient ont montré de grandes affinités morphologiques avec ces mâles. Nous pensons qu'il s'agit de la femelle de cette espèce, inconnue jusqu'ici. Nous la décrivons sous le nom de *P. cayennensis*.

Description

Dimensions moyennes (exemplaires montés à la gomme au chloral) :

Clypeus	0,100 mm.
Tête	0,247 mm.
Thorax	0,557 mm.
Abdomen	1,620 mm.
Longueur totale	2,524 mm.
Longueur de l'épipharynx	0,175 mm.

Antennes.—Longueur totale moyenne: 1,332 mm.; longueur moyenne du segment III: 0,185 mm. Rapport: AIII/E = I. III = IV + V. Epines géniculées courtes représentant à peu près le $\frac{1}{4}$ de la longueur du segment (sur le 5me). Formule antennaire:

Palpes.—Longueur totale moyenne: 0,730 mm. Longueur moyenne de chaque segment, du 1er au 5 me (en μ): 33-87-119-120-371. Indice palpal: 1-2 (—3—) 4-5.

Cavité bucale.—Elle comprend une vingtaine de dents longues et subégales. La plage pigmentée est conique et très foncée.

Pharynx.—Il est garni de forts denticules disposés sans ordre, à sa partie postérieure.

Ailes.—Longueur: 1,646 mm.; largeur: 0,450 mm.; Rapport: longueur largeur = 3,6. $\alpha = 0,432$ mm.; $\beta = 0,324$ mm.; $\delta = 0,144$ mm. Rapports: $\alpha/\beta = 1,3$; $\alpha/\delta = 3$.

Pattes postérieures.—Longueur totale moyenne: 2,682 mm.

Fémur	0,720 mm.	Rapport: tibia/fémur = 1,2
Tibia	0,900 mm.	Rapport: tarse 1/tarse 2 = 1,6
Tarse 1	0,450 mm.	
Tarse 2	0,270 mm.	
Tarses 3, 4 et 5 . .	0,342 mm.	

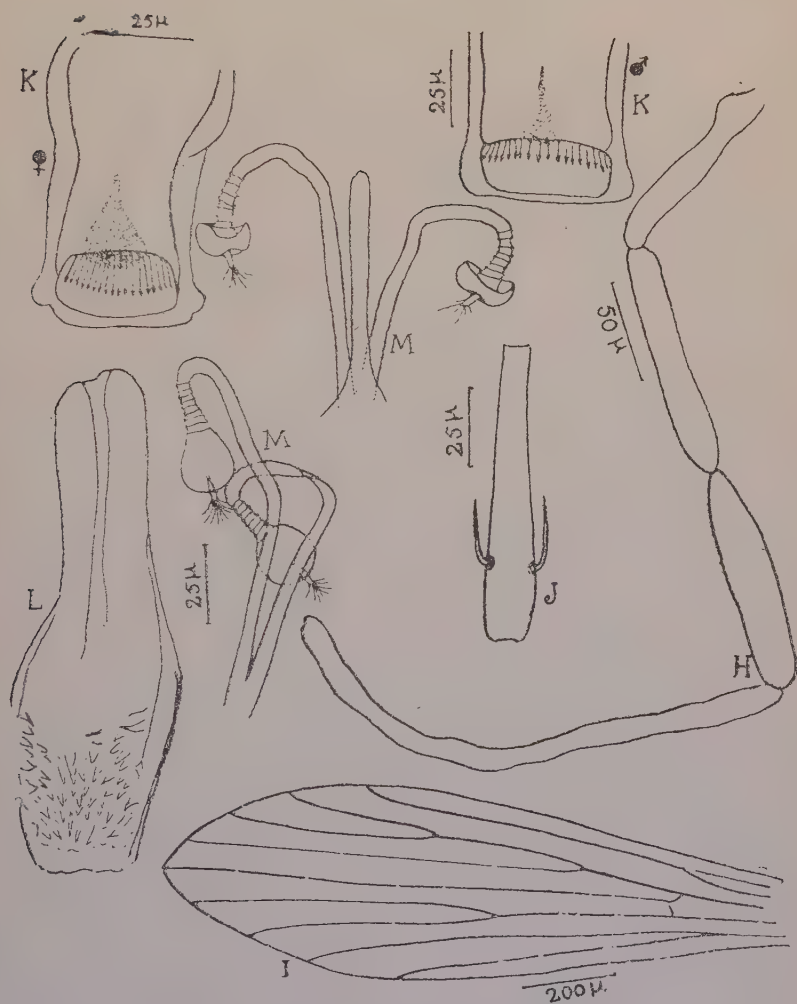
Spermathèques.—Le corps est en forme de poire avec 8-9 crenelures à la base; sa longueur est de 40 μ environ pour une largeur maximum de 20 μ . Les conduits individuels sont relativement longs (118 μ) et aboutissent à un conduit commun très court (14 μ).

Discussions

Cette femelle est voisine de *P. suis*, de *P. gomezi*, de *P. rorotaensis* et de *P. japignyi* par la structure de sa spermathèque. Elle diffère cependant de ces 4 espèces par son armature buccale qui comprend 18-20 dents longues; tandis que la cavité buccale des espèces considérées ne présente que 4 dents larges à la base et très effilées à leur extrémité.

Les *P. cayennensis* mâles du Vénézuëla ont montré après coloration une cavité buccale armée de 18 dents longues analogues à celles de la femelle. Cela nous a incité à revoir le matériel de la Guyane française qui ne comprend que des mâles et sur lequel nous n'avions pu mettre en évidence les dents de l'organe buccal lors de la description original de cette espèce. Après démontage, coloration et remontage, cet organe s'est montré identique à celui du matériel vénézuélien.

Les échantillons envoyés par le Dr. Pablo Anduze ont été capturés à Bachaquero, Zulia en Août 1947. D'autres specimens



Phlébotomes du Vénézuéla

provenaient de Rio Negro, Zulia. La femelle constituant le type est montée et conservée sous le N° 794.

Cayenne le 15 janvier 1948.

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Explication des figures:

- H — palpe
I — aile
J — segment de l'antenne
K — Cavité buccale
L — Pharynx postérieur
M — Spermatheques
-

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FIVE NEW AMERICAN TINGIDAE (HEMIPTERA)

by

CARL J. DRAKE

This paper is based largely on tingid specimens belonging to the U. S. National Museum, and contains the descriptions of five new species from the Americas. It should be noted that one of them was intercepted on shipments of dormant plants from Mexico. The disposition of types is given beneath the descriptions of the species.

Phatnoma coyazana, n. sp.

Moderately large, grayish testaceous, with brown and fuscous markings. Head brown, tumid, with seven moderately long, brownish spines, their tips testaceous. Rostrum extremely long, testaceous, extending on third venter; laminae low, testaceous, areolate. Legs dark brown, the tibiae testaceous. Body beneath dark fuscous. Eyes small, black. Hypocostal laminae uniseriate, the aerolae small.

Pronotum brown, slightly convex, finely punctate, tricarinate; median carinae long, with one row of small areolae; lateral carinae parallel, uniseriate, about as high as median, terminating in front near calli; hood raised, quadriseriate, largely testaceous; paranota moderately broad, terminating at anterior angles in a spine, obtusely angulate opposite calli, distinctly sinuate between angle and spine, testaceous, broadly embrowned along outer margins, widest at angle, there four areolae deep. Scutellum small, brown. Elytra brownish, variegated with testaceous; costal area wide, a little wider at base, rather irregularly 3-4 areolae deep, the areolae not arranged in very regular rows; subcostal area very wide, much wider than costal, with a large whitish patch near middle, with five or six slightly raised oblique veins, seven areolae deep in widest part, the areolae small, rounded; discoidal area elongate partly open within behind, with

five slightly enlarged, oblique nervures, six or seven areolae deep in widest part; boundary nervures raised, areolate the cells about four times as long as high; sutural area elongate, widening posteriorly, closely areolate.

Length, 3.65 mm.; width, 1.75 mm.

Type, female, Jutahy, Province of Goyaz, Brasil, in Drake collection.

This species is a little longer and broader than *P. barberi* Drake. The latter has the cephalic spines more erect, the paranota and costal areas more reflexed, and the cells of carinae are nearly quadrate.

Tigava hambletoni, n. sp.

Very elongate, slender, black-fuscous, the paranota and costal area testaceous or brown. Legs very long, very slender, testaceous, the tibiae partly infuscated, the tarsi fuscous. Rostrum short, extending a little beyond posternum; laminae low, brown, meeting behind. Body beneath black. Antennae very long, slender, indistinctly pilose; segment I extremely long, black, six times as long as II, the later short and black; III very long, slender, testaceous, sometimes becoming fuscous basally; IV long, black, shortly pilose, slightly more than one-third the length of three. Head black, with three spines; hind pair of spines long, appressed, brown; median spine much shorter, black directed, slightly downward; eyes large, black.

Pronotum elongate, distinctly narrowed anteriorly, moderately convex, coarsely pitted, tricarinate; lateral carinae long, extending anteriorly to calli, slightly convex within, non-areolate, paranota narrow, uniseriate; calli impressed, black, shiny. Elytra very long, slightly wider behind, the apices jointly rounded in repose; costal area moderately wide, uniseriate, the areolae clear; subcostal area biseriate, the areolae small and clear; discoidal area not reaching middle of elytra, narrowed at both ends, widest a little behind middle, there five areolae deep; sutural area large, closely reticulated. Length, 4.40 mm.; width, 1.00 mm.

Type (male) and allotype (female), Tingo Maria, Peru, May, 1946, taken by E. J. Hambleton, in whose honor the insect is named. The dark color and narrow uniserate paranota distinguish this species from other members of the genus. The type has a whitish, testaceous paranota and costal area, and is deposited in U. S. National Museum.

Tigava tingoana, n. sp.

Head black, the eyes large, black; hind pair of spines long, slender, testaceous, appressed, extending to front margins of eyes; median spine shorter, directed forward, darkened at base. Antennae very long, indistinctly pilose; segment I very long, black six times as long as II; II very short, black, III very long, testaceous, two and one-half times as long as IV; IV very long, mostly black, clothed with short yellowish hairs. Rostrum short, its tip resting on anterior portion of mesosternum; laminae testaceous, low, uniseriate.

Pronotum coarsely pitted, sharply tricarinate, ferrugineous, the median portion fuscous; lateral carinae slightly divergent anteriorly, indistinctly areolate; median carina slightly higher, and higher in front, the areolae fairly distinct; collar raised anteriorly, areolate, testaceous in front; paranota narrow, testaceous, finely areolate. Elytra long, dark fuscous, the marginal area testaceous; costal area uniseriate, the areolae moderately large and clear, the outer margin finely serrate; subcostal area biseriate; discoidal area narrowed at both ends, widest a little beyond middle, there four areolae deep.

Length, 4.30 mm.; width, 1.00 m.

Type (male), allotype (female) and 1 paratype, Tingo Maria, Peru, May, 1946. Type in U. S. National Museum.

Differs from the species described above by its color, shorter and stouter pronotum, and wider paranota. *Tigava spatula* Monte has the paranota biseriate in front.

Odeotingis mexicana, n. sp.

Head short, black, with five testaceous spines, the hind pair longest, fuscous basally. Antennae moderately long, slender,

smooth, testaceous; segment I shorter, stouter and a little longer than II; III very slender, nearly three times as long as IV; IV short, about as long as the first two taken together. Rostrum long, brownish, blackish at tip, nearly attaining apex of sulcus; laminae testaceous, areolate, almost meeting behind. Legs slender, testaceous, the tips of tarsi dark. Pronotum beneath blackish, the venter brown. Orifice present. Hypocostal laminae narrow, uniseriate.

Pronotum moderately convex, pitted, black-fuscous, the paranota, carinae and triangular process largely testaceous; hood moderately large, about as high as long, inflated, the veinlets fuscous; calli deep, black; paranota rather large, the outer two rows of cells turned inwardly so that the outer margin rests on pronotum; carinae low, uniseriate, about equally elevated, the lateral carinae slightly constricted behind disc; hind process areolate, testaceous. Elytra broad, testaceous, the apices a little separated in repose; costal area wide, triseriate, the areolae hyaline; subcostal area very narrow, biseriate; discoidal area large, extending beyond middle of elytra, narrowed at both ends, widest near middle, there five areolae deep, the outer margin broadly rounded; discoidal area large, with areolae large and subequal in size to those of costal area. Venter brown.

Length, 3.80 mm.; width, 1.30 mm.

Type, male, Guerrero, Jan. 28, 1946, intercepted on living plant materials at Laredo, Texas. U. S. National Museum. This is the second new species of tingids described in this paper that was intercepted on foreign plant imports by the U. S. Federal port inspectors.

This species slightly modifies the generic conception. The hood and paranota are smaller and not as strongly inflated as in *O. williamsi* Drake. However, it fits the genus *Odeotingis* Drake better than *Leptodictya* Stal.

Leptocysta notialis, n. sp.

Head brown, the spines long, appressed, completely covered by hood, save sides and eyes. Bucculae broad, contiguous in

front, areolate, mostly fuscous. Rostrum testaceous, dark at apex, extending a little beyond mesosternum; laminae high, testaceous, not quite meeting behind, with one row of very large areolae. Hypocostal laminae uniseriate. Orifice with prominent rim. Antennae testaceous, indistinctly pilose; segment I thicker and twice as long as II, the latter short; III long, slender, about three times as long as IV; IV fusiform the apical two-thirds black. Legs testaceous, slender, shortly setose, the tibiae dark.

Pronotum brown, coarsely punctate, moderately convex, the hind process testaceous, areolate; paranota large, reflexed, with outer margin somewhat rounded, with a few short spines in front, widest just in front of humeri, there five or six areolae deep, the areolae moderately large, clouded with fuscous behind, opaque in front. Hood long, gradually narrowed anteriorly, extending considerably in front of head, posteriorly not attaining middle of disc, about twice as long as high; median carina high, slightly higher than hood, with fuscous spot behind middle, a little longer than hood; lateral carinae long, subparallel, extending forward to calli, separated a little distance from the sides of hood, uniseriate, the areolae subequal in height and length. Elytra very broad, gradually widening from base to transverse, fuscous fasciae, slightly constricted beyond middle, with margins unarmed; costal area very wide, four areolae deep at transverse band and five in widest part, the areolae opaque, dark fuscous in basal and apical bands; subcostal area narrow, uniseriate; discoidal area long, elliptical, narrow at base and apex, widest at middle, there five areolae deep; sutural area brown or fuscous.

Length, 4.70 mm.; width, 2.40 mm.

Type (male), allotype (female) and 1 paratype, Rosas, F. C. Sud., Province of Buenos Aires, taken by Juan B. Daguerre, in Drake collection.

This species is longer, and has a longer lateral and much longer median carinae than *L. sernebulosa* Stal. The elytra are more sharply expanded basally than in the latter species.

NEW AMERICAN TINGIDAE (HEMIPTERA)

by

CARL J. DRAKE

This paper contains the description of six new species and one new variety of tingids from the Western Hemisphere. The disposition of types is given under each description.

Phatnoma guatemalana, n. sp.

Head dark brown, with five, stout, blunt, moderately long spines, the median pair stoutest. Antennae moderately long, slender, brown, smooth; segment I short, longer and stouter than II; III very slender, slightly more than twice as long as IV, the latter slightly enlarged apically. Rostrum extremely long, yellowish brown, extending on last venter. Body beneath dark brown. Legs dark brown, the tarsi lighter. Orifice with a prominent, almost circular, testaceous rim.

Pronotum very coarsely pitted, slightly convex, tricarinate, dark fuscous, the front portion of collar and anterior part of paranota whitish testaceous; median carina profund, uniseriate, higher than lateral pair; lateral carinae extending as far forward as calli, low, uniseriate, the areolae tiny. Paranota moderately wide, angulate in front, without long spine, the margin in front of humeri rounded (not angulate), there four areolae deep. Elytra broadly ovate, evenly rounded behind; costal area very wide, mostly five areolae deep, four along middle, brown, some nervelets here and there testaceous; subcostal area wide, mostly five areolae deep, with four, transverse, enlarged, embrowned nervures; discoidal area long, open behind, with two, oblique, enlarged nervures, the outer boundary raised, areolate, the areolae low and elongate, the inner boundary not areolate.

Length 3.15 m.; width, 1.70 mm.

Type (female), Guatemala City, Guatemala, intercepted on *Epidendrum cochleatum*, March 27, 1947, at the San Francisco Port of Entry, in U. S. National Museum.

Phatnoma annulipes Champion

Specimens have been examined from Guatemala, Costa Rica, and Peru. This species has by far the widest paranota of all American *Phatnoma*.

Phatnoma annulata concisa, n. var.

Differs largely from typical *P. annulipes* in having the paranota about three-fifths as wide. The anterior-lateral margin excavated, there only 5 or 6 areolae deep. Other structures and size very similar to *annulipes*.

Type, male, Caracas, Venezuela, in Drake collection.

Phatnoma trinidadana, n. sp.

Similar to *P. marmorata* Champion in general color and markings but with much narrower costal area and narrower paranota. Head brown, the front pair of spines shorter. Pronotum coarsely pitted, tricarinate, each carinae uniseriate, the lateral pair terminating at calli; paranota not widely expanded, terminating in spine at anterior end, widest at angulate point in front of humeri, there four areolae deep, biseriate in front, there subequal to collar in width.

Elytra a little longer than abdomen, broadly ovate, brownish, the nervelets variegated with testaceous; costal area moderately wide, triseriate along middle, quadriseriate in front and behind; subcostal area wide, with four oblique testaceous nervures; discoidal area elongate with three or four oblique testaceous nervures, the boundary nervures foliaceous and aerolate, obsolete and open behind. Antennae long, slender, brown, the fourth segment moderately thickened and black apically. Lateral carinae slightly less elevated than median. Legs brown, each femora with a testaceous annulation before apex. Rostrum long, extending on venter, its apex concealed by card point. Orifice prominent.

Length, 3.00 mm.; width, 1.70 mm.

Type, female, Trinidad, B. W. I. collected by Dr. A. M. Adamson in Drake collection.

The wider paranota and parallel lateral carinae of pronotum separate this species from *P. ovata* Champion, its closest relative.

Amblystira machalana, n. sp.

Black, polished, the appendages and apical portion of costal area testaceous, the distal two-thirds of sutural area brown to black fuscous. Pronotum strongly tumid, deeply pitted; median carina sharply raised; lateral carinae scarcely or not very well defined; collar distinct; pronotal margins carinate. Head short, unarmed. Antennae shortly pilose, testaceous, the distal two-thirds of fourth segment black-fuscous; segment I slightly thicker and slightly longer than II; III not twice as long as IV; IV rather long, clothed with longer hairs.

Elytra very strongly constricted a little before apex, the costal areas overlapping and jointly rounded apically in repose; costal area uniseriate, the areolae small, tiny along basal portion; subcostal area wide, largely four to five areolae deep; discoidal area not quite reaching middle of elytra, not elevated and subtruncate at apex, there four areolae deep; sutural area with areolae whitish before apex. Legs testaceous, the tips of tarsi fuscous. Rostrum almost reaching base of mesosternum, the laminae black.

Length, 2.95 mm.; width, 1.10 mm.

Type (male) allotype (female) and many paratypes, Machala, Ecuador, October 27, 1944, E. J. Hambleton. Many paratypes, Machala, Vines, oct. 14, 1944, and Pichilingue, Ecuador 15, 1944; Types in Drake collection.

Separated from *A. apaca* Champion and related forms by the strongly constricted elytra. In some examples the lateral carinae of pronotum are scarcely visible. The paranota are carina-like.

Leptodictya socorrana, n. sp.

Allied to *L. plana* Heidemann and readily separated from it by the smaller hood and narrower costal area of elytra. Antennae testaceous, indistinctly hairy; segment I short, stouter and twice as long as II; III longest, slenderest, straight; three times as long as IV, the latter brownish and moderately thickened. Rostrum extending a little beyond middle of mesosternum, the channel open behind, the laminae, whitish and areolate.

Pronotum moderately convex, sharply tricarinate, each carina finely areolate; paranota narrower but similar in shape to *plana*; hood also similar in shape but only about one-half as large as in *plana*. Elytra with apices somewhat narrower and separated in repose; costal area mostly triseriate, the areolae not arranged in very definite rows. Other characters as in *L. plana*.

Length, 3.50 mm.; width, 1.20 mm.

Type (male), allotype (female) and numerous paratype Socorro Island, Brthorote Bay, May 7, 1925, taken by H. H. Keifer, in California Academy of Sciences.

This species may be separated from *L. tabida* H. S. by the much narrower costal area, shorter cephalic spines, and larger hood, the hood projecting distinctly farther forward. In *L. plana* Heid., the hood is nearly twice as long as *L. socorrana*.

Acanthocheila comitis, n. sp.

Very similar to *A. nexa* Drake from Argentina, but differs from it in having shorter antennae, smaller and more sharply raised tumid elevation of elytra and slightly narrower paranota and costal area. Antennae testaceous, long, pilose; segment I short, cylindrical, stouter and one and one-half times as long as II; III beset with hairs of two different lengths (sparsely with very long hairs and densely with shorter hairs), One and one-third times as long as IV; IV rather long, dark fuscous. Pronotum moderately convex, unicarinate, the carina not very dis-

tinct on apical portion of triangular process; paranota uniseriate, testaceous, the outer margin armed with long spines.

Elytra with outer margins beset with long spines for about threefourths its length, the spines becoming shorter distally, with outer apical and distal half of inner margin densely hairy, the hairs much longer along the basal half of outer margin; costal area narrower and uniseriate along basal third, much wider and biseriate at widest part; tumid elevation sharply raised, small, dark; discoidal and sutural area not clearly defined the apical half of elytra testaceous, the areolae hyaline. Other characters similar to *A. nexa*.

Length, 2.90 mm.; width, 1.10 mm.

Type, female, Magdalena Island, Tres Marias, off West Coast of Mexico, May 20, 1925, collected by H. H. Keifer.

In *A. nexa*, the costal area is slightly wider basally and the margins of elytra are not as densely hairy. Type in California Academy of Sciences.

Corythucha scitula, n. sp.

Antennae testaceous, longly pilose; segment I stouter and nearly three times as long as II; III twice as long as IV, the latter fusiform enlarged and dark apically. Rostrum brownish, reaching meso-metasternal suture. Hood moderately large, projecting beyond head, strongly constricted at middle, narrowed anteriorly, nearly twice as long as high, the inflated hind portion covering disc of pronotum and narrowed at crest. Median carina foliaceous, much shorter than hood; arched a little behind crest, there biseriate, with one large cell in front. Lateral carinae short, triangular, testaceous. Paranota large, whitish testaceous, with brown spot in front, the outer margin rounded and armed with short, black-tipped spines. Pronotum brown, finely pitted, the hind process acuminate, whitish, areolate. Elytra subquadrate, whitish testaceous with broad basal and subsapical bands dark brown-fuscous, each with a clear areolae between bands and along apical margin hyaline; tumid elevation moderately large, narrowed at crest. Dorsal surface of hood

and hind part of bulla of elytra dark brown-fuscous. Legs slender, testaceous, the tarsi dark.

Length, 2.85 mm.; width, 2.20 mm.

Type (male) and allotype (female) Stayton, Oregon, Aug. 29, 1933, on *Corylus rostrata*, taken by B. G. Thompson. Paratypes, 10 specimens, Same labels as type, in Drake collection.

Differs from *C. padi* Drake in having smaller tumid elevation of elytra and the inflated hind portion of hood narrowed dorsally towards crest.

NOTES ON THE GENUS *DIATRAEA* GUILDING (LEPID., PYRAL.)

(INTRODUCTION AND PARTS I, II AND III)

By

HAROLD E. BOX

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INTRODUCTION

The object of this series of Notes is to review the history and present a summary of our knowledge of the genus *Diatraea*, and of the more important economic species, with special reference to those occurring in tropical South America, particularly in Venezuela and adjacent territories.

The genus comprises a fairly natural and homogeneous assemblage of more than fifty species of moths, the larvae of which are almost exclusively borers in the stems of various Gramineae; a few are known in *Cyperus* spp. (Cyperaceae) and *Typha* spp. (Typhaceae). Certain of them, notably the genotype, *D. saccharalis* (Fabr.), are well-known pests of sugar-cane (*Saccharum officinarum* L.), Indian corn or maize (*Zea mays* L.), rice (*Oryza sativa* L.), and other cultivated

plants of this family, in tropical and subtropical continental America and the West Indies.

These "borers" have been recognised as pests of sugar-cane since the last quarter of the XVIIIth century, and possibly earlier, and the main features of their life-history have been known for more than a hundred years, but these early records refer almost entirely to one species, *D. saccharalis*. It was not until later in the history of the genus that other species began to be recognised as pests, but as these were seldom referred to by their correct scientific names, there is much confusion in the literature concerning them, which it has required many years of study, by various entomologists, to unravel. Several valuable contributions to the taxonomy, by Zeller, Fernald, Druce, Hampson, and other systematists, had been made during the latter half of the XIXth century, and since then there has been a steady increase in the number of new specific names, with an unusually high percentage of validity among them, attributable to Dyar, Schaus, Hampson, Heinrich, and the present writer. It was not until 1927, however, that a really serious attempt was made to revise the group on modern lines, this necessary work being undertaken by Dyar and Heinrich, and based on the collections in the United States National Museum, and these authors were the first to employ the characters of the male and female genitalia in specific diagnosis. Nevertheless, little was done to clarify the nomenclature of the older species, the types of which are in European museums. This task was attempted by the present writer, with facilities placed at his disposal in London by the authorities of the Imperial Institute of Entomology and the British Museum (Natural History), as well as by the late Lord Rothschild at Tring, the results appearing in 1931. This work owed much to Mr. W. H. T. Tams, of the British Museum, and many others who collaborated, particularly Mr. Carl Heinrich, of the U. S. National Museum at Washington. In a later study, published in 1935, the writer was able to incorporate data concerning the magnificent collections, mostly of moths reared from larvae in known food-plants, made by the late Dr. J. G. Myers in the course of his several explorations in South America and the West Indies. He feels, therefore, in a specially

privileged position to offer these Notes, in the hope of stimulating further interest among students in this important genus, which includes some major pests responsible for losses amounting annually to many thousands of tons of agricultural produce in the countries affected by them.

The only proven method of combating the species of *Diatraea* which have become pests is by means of Biological Control, and where this has succeeded the results have been eminently satisfactory, even spectacular, though apparently not sufficiently so to have warranted large-scale efforts in many other countries, where hope has too soon been abandoned, sometimes after attempts of a most preliminary nature. In truth, very few avenues have been thoroughly explored, and there remain vast possibilities, full advantage of which can only be taken when the investigator is armed with mankind's most powerful weapon—knowledge. Today, the control of major insect pests—and several *Diatraea* species are within this category—is a matter of outstanding importance, because of the urgent need to conserve the world's food supplies, especially sugar and corn products, and it becomes increasingly imperative to check this colossal and unnecessary waste of food and human effort.

The writer makes no apology, therefore, for presenting these Notes, which contain little that is original, but rather a critical review of the results of previous workers in the field. He offers, however, a sincere hope that they may prove interesting, and also aid others to a better understanding of the problem, which is deeply rooted in the history of the development of the sugar industry in the West Indies and the American continents.

PART I.—SYSTEMATIC POSITION AND GENERAL CHARACTERS

The genus *Diatraea* Guiling belongs to the order Lepidoptera, family Pyralidae, subfamily Crambinae, and, as recognised today, its geographical distribution is limited to continental

America and the West Indian islands. Dyar and Heinrich (1927) refer the genus to "that section of the subfamily (Crambinae) in which vein 7 of the fore-wing arises from the (discal) cell. Among the genera so characterized are some in which vein 11 of the fore wing anastomoses with vein 12, which group includes *Diatraea*". Their treatment was of the American species only of *Diatraea* and allied genera, *Diatraea* at that time including numerous other species distributed in various countries of the Old World, where several of them were notorious pest of sugarcane, etc. The present writer based his work (1931) largely on material at the British Museum, with access to the types of most of the older species, and he suspected that the African and Oriental moths might prove to be generically distinct from *Diatraea sens. str.*, and in this conclusion he has been sustained by Tams (1942), who adopts *Proceras* Bojer (1856) for the non-American forms, citing *P. sacchariphagus* Bojer (from Mauritius) as the genotype.

The closest allies of *Diatraea* Guilding appear to be *Hemiplatytes* Barnes & Benjamin (California), *Xanthopherne* Dyar & Heinrich (South America), *Silveria* Dyar (Mexico), *Haimbachia* Dyar (North and Central America, with one additional species from French Guiana), and *Alamogordia* Dyar and Heinrich (New Mexico). All of these genera agree with *Diatraea* in the venation of the fore wing, but differ in other characters. The present writer incorporated two previously valid genera, viz. *Iesta* Dyar (genotype *I. lisetta* Dyar, from Florida) and *Trinidadia* Dyar & Heinrich (genotype *Diatraea minimifacta* Dyar, from Trinidad), in *Diatraea* Guilding.

Key to the Genera allied to *Diatraea* Guild.
occurring in Central and South America.
(Modified from Dyar and Heinrich, 1927)

Fore wing with vein 7 from cell; vein 11 anastomosing with vein 12.

- | | |
|---------------------------|---|
| 1. Ocelli absent | 2 |
| Ocelli present | 3 |

2. Labial palpi short, not exceeding the
maxillary *Xanthopherne* Dyar
& Heinr.

Labial palpi very long *Diatraea* Guild.

3. Hind wing with vein 6 arising below
apex of cell, remote from veins 7-8. *Silveria* Dyar.

Hind wing with vein 6 arising from
apex of cell, close to veins 7-8 . . *Haimbachia* Dyar.

The genus as at present recognised * may be defined as

* The original description, by the Reverend Lansdown Guilding (1828) is as follows:

"Fam. *Pyrallidae*. Leach

"Genus *Diatraea* (à διατρέω, perforo). Guild.

CHARACTER GENERICUS

"*Caput* parvum: *oculi* subprominuli: *antennae* setaceae, inter oculos in vertice positae, suprâ squamulosae, subtus ciliatae, scapo majori vix in maribus crassiores. *Anthia* brevis: *palpi* quatour, squamis longis hirsutis-simi: *maxillares* breves, bi-articulati, articulo basilari curvo, ultimo crassiori sub-ovato, apice subacuminato: *palpi labiales* horizontaliter elongati, rostriformes, longissimi, tri-articulati, articulo basilari brevi, curvo, crasso, secundo attenuato, tertio brevi, minori: *vertex* hirsutus: *facies* minus vestita: *alae* superiores in quiescente deflexae, elongato subtriangulares, inferiores minus plicatae: *fibulâ* completâ: *pedes* breves, medii longiores, anteriores culcitâ parvâ. *Tarsi* omnes pentameri, femora gracilia: *tibiae* quatour anticae bi-calcaratae, posticae quadri-calcaratae, (maris) floc-culiferi: *unguiculi* breves.

"*Head* small: eyes rather prominent: *antennae* setaceous, placed between the eyes on the vertex; scaly above, ciliated beneath; in the male scarcely thicker than the stem: *anthia* short: *palpi* 4, very rough with long scales; the maxillary ones short, bi-articulate, the basillary joint bent, the last thicker, subovate, somewhat pointed at the extremity; the labial *palpi* very long, rostriform, horizontal, tri-articulate, the basillary joint short, thick, curved, the second attenuated, the third smaller and shorter: *vertex* hirsute; *face* more bare: *upper wings* deflexed when the insect is at rest, elongated, subtriangular; the *lower wings* less folded: *fibula* com-

follows, the description being based on that of Dyar and Heinrich, modified to include *Iesta* and *Trinidadia*:

DIATRAEA Guilding

Diatraea Guilding 1828 — Trans. Soc. Encour. Arts, etc., xlv: 148.

Front either flat and smooth, bulging, or strongly cone-shaped. *Ocelli* absent. *Labial palpi* porrect and down-curved, smooth, beak-like, extending over twice the length of the head. *Maxillary palpi* triangularly dilated with scales. *Antennae* somewhat thickened, occasionally pectinate and generally minutely pubescent in the male, filiform in the female. *Fore wing* with vein 3 before angle of discal cell; 4 and 5 separate or united at origin or stalked together for some distance; 6 below apex of cell; 7 at apex; 8-9 stalked, from before end of cell; 10 arising basally thereof, or stalked with 8-9; 11 anastomosed with 12. *Hind wing* with veins 4-5 from the angle of the cell, separate or united at origin or stalked together for some distance.

While there is variation in some of the above characters among the different species, the writer was able to assert (1931) that "it is worthy of note that in no instance has a specimen of *Diatraea* (*sens. lat.*) been seen in which vein 11 and 12 of the fore wing do not anastomose; though in several the union of these veins is very short. This anastomosis, the characteristic palpi, and the absence of ocelli are the essential characters upon which the present conception of *Diatraea* is based, together with the type of genitalia described by Dyar and Heinrich". The

plete: *feet* short, the middle pair longer, the anterior with a small *culcita*. *Tarsi* pentamerous, thighs slender, *tibiae* of the two anterior pair of legs 2-spurred, of the hinder pair 4-spurred, and in the male flocculiferous: *unguiculi* short.

"*Larva* elongata: pedes 6; propedes, abdominales 8, anales 2: *adminiculis* coronâ completâ dispositis: *spiracula* cervicalia 2, abdominalia 16: *segmenta* abdominalia 12; 1, 2, 3, 6, 7, 8, 9, et ultimo pedatis. *Pupa* elongata, sigillis mesothoracis longitudinalibus: *segmentorum* adminiculis sparsis: *ano* angulato, spinoso.

"*Larva* elongated: feet 6; propedes, abdominal 8, anal 2; the bristles disposed in a complete ring: *spiracula*, cervical 2, abdominal 16: *abdominal* segments 12; 1, 2, 3, 6, 7, 8, and the last furnished with feet.

"*Pupa* elongated; *sigillae* of the mesothorax longitudinal; bristle of the segments scattered: *anus* angulate, spinous".

genitalia of both sexes of nearly all of the species have been figured by these authors, or by the writer. Dyar and Heinrich give the following description of these organs, the terminology being that of Busck and Heinrich.*

Male genitalia with *vinculum* rounded or triangular. *Harpe* undivided, elongately triangular; costa simple or with various modified basal or sub-basal (or both basal and subbasal) projections. *Uncus* normally triangular, with apex pointed or broadened (*fuscella*, *bellifactella*). *Gnathos* normally triangular (beak-like), with more or less spining toward apex; greatly broadened toward apex only when *uncus* is similarly modified. *Tegumen* often with basal or subbasal lateral lobes. *Anellus* a flattened or but slightly curved plate with well-developed lateral arms, and sometimes with a central projection; divided, with one element a small triangular or oval plate (*justa*) lying between the bases of sacculi of *harpes*; never hinged to *vinculum* or rigidly attached to *harpes*.

Female genitalia with *ductus bursae* very short, chitinized. *Bursa copulatrix* large; chitinized at juncture with *ductus* (heavily so in a few species), the chitinization covering upper half of bursa in *strigipennella*, in which there is also an internal median girdle of serrate chitinous ridges; without *signum*. *Ovipositor* and supporting rods normal.

Full technical descriptions of the generic characters of the larva and pupa of *Diatraea* have been given by Heinrich (in Holloway, Haley and Loftin, 1928), but are too detailed for inclusion in the present paper.

PART II.—LIST OF SPECIES

A. *Check List of Species and Subspecies, arranged chronologically, with their Geographical Distribution*

DIATRAEA SACCHARALIS (Fabricius)

Phalaena saccharalis Fabricius 1794, Skrif. af Naturh.-Selsk. (Copenhagen), iii (2): 63; pl. vii, fig. 1. Type in Copenhagen Mus. from Danish West Indies; Fabricius states "*Habitat in Americae meridionalis*".

Diatraea saccharalis (Fabr.) Comstock 1881, U. S. Dep. Agric., Entom. Rept. 1880: 240. [Not *D. saccharalis* (?) (Fabr.) Comstock, *loc. cit.*: 243 = *D. crambidoides* (Grote).]

* Busck, A. & Heinrich, C. "On the Male Genitalia of the Microlepidoptera and their systematic importance"—Proc. Ent. Soc. Wash., xxiii: 145-152 (1921).

Distribution: Southern U. S. A.; West Indies; Central America; South America (to Buenos Aires Province).

DIATRAEA LINEOLATA (Walker)

Leucania lineolata Walker 1856, List Lep. Ins. Brit. Mus., ix: 100.

Type in Brit. Mus., from Venezuela.

Diatraea lineolata (Walk.) Hampson 1895, Proc. Zool. Soc. Lond. 1895: 953.

Distribution: Bahamas; Cuba; Grenada; Trinidad; Venezuela; British Guiana; Dutch Guiana; French Guiana; Ecuador; Colombia; Central America.

DIATRAEA IMPERSONATELLA (Walker)

Crambus impersonatellus Walker 1863, List Lep. Ins. Brit. Mus., xxvii: 163. Type in Brit. Mus., from Venezuela.

Diatraea impersonatella (Walk.) Box 1931, Bull. Ent. Res., xxii: 41; pl. iii, figs. 2, 3.

Distribution: Trinidad; Venezuela; British Guiana; Dutch Guiana; Brazil; Paraguay (?); Argentina; Bolivia (?).

DIATRAEA CRAMBIDOIDES (Grote)

Chilo crambidoides Grote 1880, Canad. Ent., xii: 15. Type in Brit. Mus., from Kansas, U. S. A.

Diaraetria (sic) *crambidoides* (Grt.) Grote 1882, New Check List N. Amer. Moths: 56.

Distribution: South-eastern U. S. A.

DIATRAEA CANELLA Hampson

Diatraea canella Hampson 1895, Ann. Mag. Nat. Hist. (6) xvi: 349. Type in Brit. Mus., from Grenada.

Distribution: Martinique; St. Lucia; St. Vincent; Grenada; Tobago; Trinidad; Venezuela; British Guiana; Dutch Guiana; French Guiana.

DIATRAEA LISETTA (Dyar)

Iesta lisetta Dyar 1909, Proc. Ent. Soc. Wash., xi: 29. Type in U. S. Nat. Mus., from Dade City, Florida, U. S. A.

Diatraea lisetta (Dyar) Box 1931, Bull. Ent. Res., xxii: 18.

Distribution: Southern U. S. A.; Mexico; Panama.

DIATRAEA TABERNELLA Dyar

Diatraea saccharalis var *tabernella* Dyar 1911, Ent. News, xxii: 200. Type in U. S. Nat. Mus., from Tabernilla, Canal Zone, Panama.

Diatraea tabernella (Dyar) Dyar & Heinrich 1927, Proc. U. S. Nat. Mus., lxxi, n° 2691: 15; fig. 7.

Distribution: British Honduras; Panama; Colombia.

DIATRAEA INSTRUCTELLA Dyar

Diatraea instructella Dyar 1911, Ent. News, xxii: 201. Type in U. S. Nat. Mus., from Popocatepetl Peak, Mexico.
Distribution: Mexico.

DIATRAEA MAGNIFACTELLA Dyar

Diatraea magnifactella Dyar 1911, Ent. News, xxii: 201. Type in U. S. Nat. Mus., from Orizaba, Mexico.
Distribution: Mexico.

DIATRAEA MINIMIFACTA Dyar

Diatraea minimifacta Dyar 1911, Ent. News, xxii: 202. Type in U. S. Nat. Mus., from Trinidad.
Distribution: Trinidad; Venezuela (Caracas); French Guiana.

DIATRAEA CONTINENS Dyar

Diatraea continens Dyar 1911, Ent. News, xxii: 202. Type in U. S. Nat. Mus., from Castro, Parana, Brazil.
Distribution: Brazil.

DIATRAEA PEDIBARBATA Dyar

Diatraea pedibarbata Dyar 1911, Ent. News, xxii: 202. Type in U. S. Nat. Mus., from St. Laurent, Maroni River, French Guiana.
Distribution: Venezuela; British Guiana; Dutch Guiana; French Guiana; Argentina.

DIATRAEA AMNEMONELLA Dyar

Diatraea amnemonella Dyar 1911, Ent. News, xxii: 203. Type in U. S. Nat. Mus. from Castro, Parana, Brazil.
Distribution: Brazil.

DIATRAEA GRANDIOSELLA Dyar

Diatraea grandiosella Dyar 1911, Ent. News, xxii: 205. Type in U. S. Nat. Mus., from Guadalajara, Mexico.
Distribution: South-western U. S. A.; Mexico.

DIATRAEA PALLIDOSTRICTA Dyar

Diatraea pallidostriata Dyar 1911, Ent. News, xxii: 205. Type in U. S. Nat. Mus., from São Paulo, Brazil.
Distribution: Brazil.

DIATRAEA ANGUSTELLA Dyar

Diatraea angustella Dyar 1911, Ent. News, xxii: 205. Type in U. S. Nat. Mus., from Castro, Parana, Brazil.
Distribution: Brazil; Paraguay (?); Argentina (?).

DIATRAEA BELLIFACTELLA Dyar

Diatraea bellifactella Dyar 1911, Ent. News, xxii: 205. Types in U. S. Nat. Mus., from São Paulo and Castro, Brazil.

Distribution: Grenada; Trinidad; Brazil; Bolivia; Peru.

DIATRAEA STRIGIPENNELLA Dyar

Diatraea strigipennella Dyar 1911, Ent. News, xxii: 206. Type in U. S. Nat. Mus., from Castro, Parana, Brazil.

Distribution: Brazil.

DIATRAEA GUAPILELLA (Schaus)

Diatraerupa guapilella Schaus 1913, Ann. Mag. Nat. Hist. (8) xi: 240. Type in U. S. Nat. Mus., from Guapiles, Costa Rica.

Diatraea guapilella (Schaus) Box 1931, Bull. Ent. Res., xxii: 40.
Distribution: Costa Rica.

DIATRAEA GAGA Dyar

Diatraea gaga Dyar 1915, Proc. U. S. Nat. Mus., xlvii, n° 2050: 319.
Type in U. S. Nat. Mus., from Corozal, Panama.

Distribution: Panamá.

DIATRAEA MOROBE (Dyar)

Iesta morobe Dyar 1917, Proc. U. S. Nat. Mus., li, n° 2139: 37. Type in U. S. Nat. Mus., from Teapa, Tabasco, Mexico.

Diatraea morobe (Dyar) Box 1931, Bull. Ent. Res., xxii: 19, pl. i, figs. 18, 19.

Distribution: Mexico; Guatemala.

DIATRAEA EVANESCENS Dyar

Diatraea evanescens Dyar 1917, Insec. Insc. Mens., v: 84. Type in U. S. Nat. Mus., from Audubon Park, Louisiana, U. S. A.

Distribution: U. S. A. (Louisiana); Guatemala.

DIATRAEA VENOSALIS (Dyar)

Haimbachia venosalis Dyar 1917, Insec. Insc. Mens., v: 87. Type in U. S. Nat. Mus., from Audubon Park, Louisiana, U. S. A.

Diatraea venosalis (Dyar) Dyar & Heinrich 1927, Proc. U. S. Nat. Mus., lxxi, n° 2691: 22; figs. 16, 58.

Distribution: U. S. A. (Louisiana, Texas).

DIATRAEA OBLIQUALIS Hampson.

Diatraea obliqualis Hampson 1919, Ann. Mag. Nat. Hist. (9) iii: 543.
Type in Brit. Mus., from Goya, Prov. Corrientes, Argentina.

Distribution: Argentina (Corrientes).

DIATRAEA LENTISTRIATALIS Hampson

Diatraea lentistriatalis Hampson 1919, Ann. Mag. Nat. Hist. (9) ill. 546. Type in Brit. Mus., from Gran Chaco, near Florenzia, Argentina.

Distribution: Argentina (Gran Chaco).

DIATRAEA GUATEMALELLA Schaus

Diatraea guatemalella Schaus 1922, Proc. Ent. Soc. Wash., xxiv: 138.

Type in U. S. Nat. Mus., from Cayuga, Guatemala.

Distribution: Guatemala.

DIATRAEA POSTLINEELLA Schaus

Diatraea postlineella Schaus 1922, Proc. Ent. Soc. Wash., xxiv: 138.

Type in U. S. Nat. Mus., from Quirigua, Guatemala.

Distribution: Guatemala.

DIATRAEA MARONIALIS Schaus

Diatraea maronialis Schaus 1922, Proc. Ent. Soc. Wash., xxiv: 139.

Type in U. S. Nat. Mus., from St. Jean, Maroni River, French Guiana.

Distribution: French Guiana.

DIATRAEA UMBRIALIS Schaus

Diatraea umbrialis Schaus 1922, Proc. Ent. Soc. Wash., xxiv: 139.

Type in U. S. Nat. Mus., from St. Jean, Maroni River, French Guiana.

Distribution: French Guiana.

DIATRAEA FUSCELLA Schaus

Diatraea fuscella Schaus 1922, Proc. Ent. Soc. Wash., xxiv: 139. Type in U. S. Nat. Mus., from Carillo, Costa Rica.

Distribution: Mexico, Guatemala, Costa Rica.

DIATRAEA INDIGENELLA Dyar & Heinrich

Diatraea indigenella Dyar & Heinrich 1927, Proc. U. S. Nat. Mus., lxxi, n° 2691: 13, fig. 51. Type in U. S. Nat. Mus., from Popayán, Colombia.

Distribution: Colombia.

DIATRAEA BUSCKELLA subsp. BUSCKELLA Dyar & Heinr.

Diatraea busckella Dyar & Heinrich 1927, Proc. U. S. Nat. Mus., lxxi, n° 2691: 16, figs. 5, 53. Type in U. S. Nat. Mus., from Porto Bello, Panama.

Distribution: Venezuela (Yaracuy westwards to Táchira and Zulia)*; Colombia; Panama.

DIATRAEA ANATHERICOLA Dyar & Heinrich

Diatraea anathericola Dyar & Heinrich 1927, Proc. U.S. Nat. Mus., lxxi, n° 2691: 21. Type in U.S. Nat. Mus., from São Paulo, Brazil.
Distribution: British Guiana; Brazil.

DIATRAEA SCHAUSELLA Dyar & Heinrich

Diatraea schausella Dyar & Heinrich 1927, Proc. U.S. Nat. Mus., lxxi, n° 2691: 24, fig. 19. Type in U.S. Nat. Mus., from Chejel, Guatemala.
Distribution: Guatemala; Colombia.

DIATRAEA MUELLERELLA Dyar & Heinrich

Diatraea muellerella Dyar & Heinrich 1927, Proc. U.S. Nat. Mus., lxxi, n° 2691: 25, fig. 20. Type in U.S. Nat. Mus., from Guerrero, Mexico.
Distribution: Mexico.

DIATRAEA CAYENNELLA Dyar & Heinrich

Diatraea cayennella Dyar & Heinrich 1927, Proc. U.S. Nat. Mus., lxxi, n° 2691: 27, figs. 24, 65. Type in U.S. Nat. Mus., from Cayenne, French Guiana.
Distribution: French Guiana, Brazil.

DIATRAEA CASTRENSIS Dyar & Heinrich

Diatraea castrensis Dyar & Heinrich 1927, Proc. U.S. Nat. Mus., lxxi, n° 2691: 28, fig. 25. Type in U.S. Nat. Mus., from Castro, Parana, Brazil.
Distribution: Brazil.

DIATRAEA DYARI Box

Diatraea dyari Box 1930, Bull. Ent. Res., xxi: 307, pl. x, figs. 1-3. Type in Brit. Mus., from San Pedro de Jujuy, Prov. Jujuy, Argentina.
Distribution: Argentina (North-eastern provinces).

* Venezuelan specimens listed by Box (1931) are referable to *D. busckella* subsp. *rosa* Heinrich 1931.

DIATRAEA ARGENTINA Box

Diatraea argentina Box 1931, Bull. ent. Res., xxii: 18, pl. i, fig. 14, pl. v, fig. 2. Type in Brit. Mus., from Gran Chaco, near Florenzia, Argentina.

Distribution: Argentina (Gran Chaco).

DIATRAEA BRUNNESCENS Box

Diatraea brunnescens Box 1931, Bull. Ent. Res., xxii: 29, pl. v, fig. 1; 1935, xxvi: 326. Type in Tring Mus., from Ciudad Bolivar, Venezuela.

Distribution: Venezuela; British Guiana (Rupununi); Brazil (Rio de Janeiro).

DIATRAEA LUTEELLA Box

Diatraea luteella Box 1931, Bull. Ent. Res., xxii: 32, pl. i, figs. 7, 8, pl. iv, fig. 10. Type in Tring Mus., from Rio Cayapas, Ecuador.

Distribution: Ecuador.

DIATRAEA SUFFUSELLA Box

Diatraea suffusella Box 1931, Bull. Ent. Res., xxii: 33, pl. v, fig. 14.

Type in Tring Mus., from St. Jean du Maroni, French Guiana.

Distribution: Venezuela (without locality); French Guiana.

DIATRAEA ALBICRINELLA Box

Diatraea albicrinella Box 1931, Bull. Ent. Res., xxii: 34, pl. 1, figs. 5, 6, pl. v, fig. 15. Type in Tring Mus., from Fonte Boa, Amazons, Brazil.

Distribution: Trinidad; British Guiana; Brazil (Amazons); Peru; Ecuador.

DIATRAEA AMAZONICA Box

Diatraea amazonica Box 1931, Bull. Ent. Res., xxii: 36, pl. 1, figs. 1, 2, pl. iv, figs. 4, 5. Type in Tring Mus., from Calama, Rio Madeira, Amazons, Brazil.

Distribution: Brazil (Amazons); Argentina.

DIATRAEA RUFESCENS Box

Diatraea rufescens Box 1931, Bull. Ent. Res., xxii: 37, pl. i, figs. 3, 4, pl. iv, fig. 6 (?). Type in Tring Mus., from Buenavista (750 m.), Bolivia.

Distribution: Bolivia.

DIATRAEA ENTRERIANA Box

Diatraea entreriana Box 1931, Bull. Ent. Res., xxii: 39, pl. i, figs. 11-13, pl. iv, fig. 2. Type in Tring Mus., from La Soledad, Entre Rios, Argentina.

Distribution: Argentina (Entre Rios).

DIATRAEA FLAVIPENNELLA Box

Diatraea flavipennella Box 1931, Bull. Ent. Res., xxii: 42, pl. i, figs. 9, 10, pl. v, fig. 6. Type in Brit. Mus., from Castro, Parana, Brazil.

Distribution: Brazil.

DIATRAEA CONSIDERATA Heinrich

Diatraea considerata Heinrich 1931, Proc. U.S. Nat. Mus., lxxix, n° 2879: 3, figs. 11, 12. Type in U.S. Nat. Mus., from Eldorado, Sinaloa, Mexico.

Distribution: Mexico.

DIATRAEA BUSCKELLA subsp. ROSA Heinrich, new status

Diatraea busckella var. *rosa* Heinrich 1931, Proc. U.S. Nat. Mus., lxxix, n° 2879: 4. Type in U.S. Nat. Mus., from Carabobo, Venezuela.

Distribution: Venezuela (Miranda, Aragua, Carabobo, Cojedes, Yaracuy, Apure States and the Federal District).

DIATRAEA MYERSI Box

Diatraea myersi Box 1935, Bull. Ent. Res., xxvi: 331, pl. xii, figs. 1, 2. Type in Brit. Mus., from Recreo, Lower Amazons, Brazil.

Distribution: Brazil (Amazons).

DIATRAEA SAVANNARUM Box

Diatraea savannarum Box 1935, Bull. Ent. Res., xxvi: 332, pl. xii, figs. 3-4. Type in Brit. Mus., from Rupununi Savannas, at base of Shiriri Mt., British Guiana.

Distribution: British Guiana (Rupununi).

DIATRAEA MARITIMA Box

Diatraea maritima Box 1935, Bull. Ent. Res., xxvi: 333, pl. xii, figs. 5, 6. Type in Brit. Mus., from Georgetown, British Guiana.

Distribution: British Guiana (coastal flats).

*B. Synonymic alphabetical Index to Genera and Species
recognised in Diatraea Guild.*

(Synonyms are indicated in Italics)

Chilo Zincken.

crambidoides Grote = *D. crambidoides* (Grt.)

culmicolellus Zell. = *D. lineolata* (Walk.)

neuricellus Zell. = *D. lineolata* (Walk.)

obliteratellus Zell. = *D. saccharalis* (Fabr.)

Crambus Fabr.

impersonatellus Walk. = *D. impersonatella* (Walk.)

leucaniellus Walk. = *D. saccharalis* (Fabr.)

lineosellus Walk. = *D. saccharalis* (Fabr.)

sacchari Fabr. = *D. saccharalis* (Fabr.)

Diaraetria Grote = *Diatraea* Guild.

Diatraea Guild.

albicrinella Box

amazonica Box

amnemonella Dyar

anathericola Dyar & Heinr.

angustella Dyar

argentina Box

bellifactella Dyar

brunnescens Box

busckella Dyar & Heinr.

subsp. *busckella* Dyar & Heinr.

subsp. *rosa* Heinr.

canella Hamps.

castrensis Dyar & Heinr.

cayennella Dyar & Heinr.

considerata Heinr.

continens Dyar

crambidoides (Grote)

crambidoides Barnes & McDunn. *et auctt.* = *D. saccharalis* (Fabr.)

culmicolella (Zell.) = *D. lineolata* (Walk.)

dyari Box

entreriana Box

evanescens Dyar

flavipennella Box

fuscella Schs.

gaga Dyar

grandiosella Dyar

guapilella (Schs.)

guatemalaella Schs.

impersonatella (Walk.)

incertella Box = *D. brunnescens* Box

incomparella Dyar & Heinr. = *D. saccharalis* (Fabr.)

indigenella Dyar & Heinr.

instructella Dyar

lentistriatalis Hamps.

lineolata Barnes & McDunn. *et auctt.* = *D. grandiosella* Dyar

lineolata (Walk.)

lisetta (Dyar)

luteella Box

magnifactella Dyar

maritima Box

maronialis Schs.

minimifacta Dvar

moorella Dyar & Heinr. = *D. impersonatella* (Walk.)

morobe (Dyar)

muellerella Dyar & Heinr.

myersi Box

neuricella (Zell.) = *D. lineolata* (Walk.)

obliquualis Hamps.

obliteratella (Zell.) = *D. saccharalis* (Fabr.) (pt.)

D. tabernella Dyar (pt.)

pallidistricta Dyar

pedibarbata Dyar

pedidocla Dyar = *D. saccharalis* (Fabr.)

postlineella Schs.

rufescens Box

saccharalis (Fabr.)

var *crambidoides* Dyar = *D. saccharalis* (Fabr.)

var. *grenadensis* Dyar = *D. saccharalis* (Fabr.)

var. *obliterallis* (—us) Rosenf. & Barb. = *D. saccharalis* (Fabr.)

var. *obliteratella* (Zell.) = *D. saccharalis* (Fabr.)

var. *saccharalis* (Fabr.) = *D. saccharalis* (Fabr.)

var. *tabernella* Dyar \equiv *D. tabernella* Dyar

sacchari Guild, = *D. saccharalis* (Fabr.)

var. *brasiliensis* Van Gorkum & de Waal = *D. saccharalis* (Fabr.)

savannarum Box

schausella Dyar & Heinr.

sobrinialis Schs. = *D. evanescens* Dyar

solipsa Dyar = *D. gaga* Dyar

strigipennella Dyar

suffusella Box

tabernella Dvar

tripsacicola Dvar = *D. crambidoides* (Grt.)

umbrialis Schs.

venosalis Dyar

zeacolella Dvar = *D. crambidoides* (Grt.)

Diatraerupa Schs. = *Diatraea* Guild.

Hajmbachia Dyar

venosalis Dyar = *D. venosalis* (Dyar)

Iesta Dyar = *Diatraea* Guild.

adulcia Dyar = *D. lisetta* (Dyar)

cancellalis Dvar = *D. lisetta* (Dyar)

guapilella Schs. = *D. guapilella* (Schs.)

lisetta Dyar = *D. lisetta* (Dyar)

morobe Dyar = *D. morobe* (Dyar)

Leucania Ochs.

lineolata Walk. = *D. lineolata* (Walk.)

Phalaena Fabr.

saccharalis Fabr. = *D. saccharalis* (Fabr.)

sacchari Sepp = *D. canella* Hamps.

Trinidadia Dyar & Heinr. = *Diatraea* Guild.

PART III.—HISTORY OF THE GENOTYPE, *D. SACCHARALIS* (FABRICIUS) (THE SUGAR-CANE MOTH BORER)

During the last quarter of the XVIIIth century there was considerable alarm in several of the West Indian islands because of the damage being done to the sugar-cane plantations by an insect which was called "The Borer". The earliest actual published reference* appears to be that of John Luffman, in his

* Sir Hans Sloane, in the second volume of his work on the Natural History of Jamaica, published in 1725, makes mention of an insect which he terms "*Eruca minima e rubro fusca*". His quaint description is rather vague, and therefore cannot be accepted as a positive reference to the Borer here considered. It is, however, sufficiently interesting to merit transcription:

"XXVIII. *Eruca minima e rubra fusca*,
The Worm eating the Sugar Canes.

"This is not over one third of an Inch long, and not so thick as a Hens Quill, reddish brown of colour. It is convey'd in at first by a round Hole made in the green Sugar Cane, and thence makes a two or three Inches long, round, red cavity the length of the Cane whence when perfect it comes out.

"It is in Probability a Sort of a Butterfly, Moth, Beetle or Weevill, which thrusts in the Egg, then tis hatch'd and feeds on this Cane till it be ready to be turn'd to an *Aurelia*, whence it comes out and leaves a greyish skin which I have often found in the Canes so spoil'd.

"The Canes so eaten are not fit to make Sugar, and therefore are ground to make Rum, or given to the Hogs to feed on.

"Sometimes Ants eat into the Canes, and have their young in them".

Several modern authors have cited, in the bibliography of the Sugar-cane Moth Borer, C. Hamilton's description of an insect damaging sugar-

literary correspondence from the island of Antigua in 1788 (published in 1789), who tells us:

Letter XXVII
(Letter of January 27, 1788)

"An insect, called the Borer, has found its way into the canes. This destroyer perforates the rind of the plant and works to a joint or partition, then turns out and re-perforates till the cane, thus attacked, is entirely ruined. I have seen whole pieces, on as fine land as this country affords, rendered totally useless, by the ravages of this insect, and where the evil is only partial, the sugar produced from such canes, is of the worst quality, and bears the appearance of tar....."

Sir John Laforey contributed some interesting notes to G. R. Porter's treatise on *The Nature and Properties of the Sugar Cane*, first published in 1830 (second edition 1843):

"In some of the Windward Island a kind of grub, called the borer, in very dry weather, commits depredations on the cane. This insect was found fatally destructive in Guadeloupe in the years 1785 and 1786. The Otaheite plant is found to be less liable to this casualty than the old canes".

and elsewhere in the same work:

"A gentleman of Montserrat had some plants given to him in the year 1791 by Mr. Pimel, one of the most considerable planters of Guadeloupe, who told him that, in the preceding

cane in Nevis and Antigua: "*In iis Insulis Antillis..... nouam vermium speciem..... cannis sacchariferis tantum damni intulisse.....*", published in the *Commercium Litterarium ad rei Medicae et Scientiae Naturalis.....* (Norimbergae, Annus MDCCXXXIV (1734)). The writer has seen a transcription of this rare work, and finds the account to apply to one of the Homoptera rather than to a boring Lepidopterous larva. (Vide Box, H. E. "An early Reference to Sugar-cane Entomology in the British West Indies", The West India Committee Circular, October 26th, 1933).

Another bibliographical error is the citation of G. Hughes' *Natural History of Barbados* (London, 1750) with reference to the Borer. The account here is of "The Blast", caused by an entirely different insect, but which seems to have appeared epidemically in several West Indian islands during the XVIIIth century. There is some evidence that "The Blast" was caused by the insect later described as *Delphax saccharivora* Westwood, which conceivably may also have been Hamilton's *Vermium*.

year, when an exceeding great drought had prevailed, he had amongst a large field of the Island Canes, half an acre of these; that the want of rain, and the ravages of the borer, had damaged the former so much that he could not make any sugar from them, but that the latter had produced him three hogsheads.

"In the spring of the year, 1794, a trial was made of the Malabar canes on one of my plantations. The weather had then been so very dry, and the borer so destructive, that I am sure no one part of that plantation would have yielded about half that quantity from the other canes in the space of ground".

William Beckford, recounting conditions in Jamaica in a descriptive work published in 1790, seems to have confused the damage caused by the Borer with that of another insect, and his history is consequently rather more imaginative than accurate, though nevertheless not unworthy of our attention:

"..... The yellow and the black blast are both almost indescribably pernicious; but the former is particularly destructive. It is called the yellow, from its giving that colour to the leaves, and which is occasioned by large nests of insects that sap the root, relax the fibres, and bore into substance of the canes, and from which particular property they are called Borers, in the Leeward and French islands; and by which many estates have been destroyed, and the owners constrained to forego, for some years at least, the cultivation of this valuable but uncertain plant. The black blast....."

It was not until 1794, however, that this threat to the West Indian sugar industry, called the Borer, received scientific attention, and in that year the insect was described and figured, under the name *Phalaena saccharalis*, by the great Danish entomologist Johan Christian Fabricius, student of Linnaeus, from material and information which he had received from the Danish West Indies. Actually, the original description, accompanied by engravings of the larva, pupa and adult moth, first appeared in a little-known memoir entitled "*Beskrivelse over den skadelige Sukker-og Bomulds-Orm i Vestindien, og om Zygaenae Pugionis Forvandling*" (Descriptions of the injurious Sugar-and Cotton-Worms in the West Indies, and Notes on the Life-History of

Zygaena Pugionis), published at Copenhagen in the third volume of the *Skrifter af Naturhistorie-Selskabet*.

Fabricius' account of the insect, translated from the old Danish, with the original description in Latin, is as follows:

"In connection with insect pests it is of the greatest importance to be able to detect the signs of injury, for in many cases the destruction of the plant is so rapid that it is not detected until too late to take any steps to prevent it. To such injurious caterpillars belong particularly two, which in the West Indies, cause most serious harm to sugar and cotton plants. For sending me information concerning these I have to thank my worthy friend and promoter in Science, Lieut. Colonel von Rohr, and for the figures of the insects his friend Captain Mühlenfels, to whom I beg to offer my humblest thanks for his friendly assistance.

"The first or sugar caterpillar has, so far as I know, never yet been described or figured. Englishmen in the West Indies call it the *Boarer* (sic), and it is capable of reducing a sugar crop of 300 barrels to 20-30 barrels. The larva develops into a small moth, known according to the classification of Linnaeus, as a *Pyalid*.

"Phalaena saccharalis alis striatis cinereis: margine postico atro punctato.

Habitat in Americae meridionalis Saccharo, cujus caules perforat, exsiccat, destruit plantationum pestis.

Corpus parvum, cinereum, immaculatum. Palpi exserti, approximati. Alae anticae cinereae, interdum strigis duabus obscurioribus, obsoletis, interdum fere immaculatae. Margo posticus striga punctorum. Posticae albae immaculatae.

Larva 16 poda, pallide hyalina capite punctis que utrinque octo brunneis.

Puppa nuda, elongata, brunnea anticae spinis plurimis, elevatis, brevibus.

"The little moth lays its eggs in the stems of the young sugar cane*, the newly-hatched larvae feeding in the heart of

* This, of course, is incorrect. The eggs are invariably laid on the leaves of the plant in which the larva feeds. In most other respects the account is remarkably accurate.

the young and tender plant. By the time this has died, the adjacent plants have grown up, but the larvae also, not having completed their development, bore into the stronger sugar cane plants until the last sugar cane begins to form and the larvae become mature. Before maturing the larva bores an exit for the moth between the wood and bark of the stem, and in this bored-out tunnel it pupates. After emergence the moth creeps comfortably out through the bored opening. The young borers are never found in hard or old sugar tissues as they have not enough strength to borer into them, but select plants suitable for their age. The pupae generally lie quite near the opening in order that the moth can creep out, but in some cases once or twice the length of the caterpillar behind the opening, which suggests that the larva completed the opening a little before it had finished its development.

"After the ripe sugar cane comes into the mill there is little or no juice in it. The greater part is quite dry, or where a little sap remains there is much syrop and rum but no sugar, or at least none which can be boiled".

In the same year (1794), the formal description was reprinted almost *verbatim* in Fabricius' *Entomologia Systematica*, this having been generally but erroneously accepted as being its first appearance in print. In the *Supplementum Entomologicae Systematicae* (1798), Fabricius changed the name of the insect to *Crambus sacchari*.

In the *General System of Nature*, a systematic work edited in 1806 by William Turton, M. D., Fabricius' original name, *Phalaena saccharalis*, is adopted and his description appears translated into English, the provenience being rendered as "Inhabits South America, in the Sugar Cane, which it dries up and destroys: is very destructive to plantations".

The first and subsequent four edition of Kirby and Spence's *Introduction to Entomology* (1815-1828) refer to "the borer" as a pest of sugar-cane, but no scientific name is given, and it would seem that the work of Fabricius was not known to these authors at that time. They state that the Society of Arts*, in

* The Society for the Encouragement of Arts, Manufactures and Commerce, until 1845, when it received the Royal Charter and became the Royal Society of Arts.

London, had offered a Prize of Fifty Guineas to whoever might be able to destroy this pest.

There is no record that this prize was ever actually won, but "The Gold Ceres Medal was voted (by the Society) to the Rev. Lansdown Guilding, B. A., F. L. S., F. G. S., etc., for his Memoir on the Insects that infest the Sugar-Cane in the West Indies", published under that title in the Society's *Transactions* in 1828, with engravings illustrating the various stages of the insect and its damage in mature sugar-cane. Guilding was a clergyman resident in the island of St. Vincent; he was also a scholar and an ardent naturalist, and apparently familiar with the works of the older systematists. It is curious, therefore, that he did not know of the work of Fabricius mentioned above, for he elaborated technical generic and specific descriptions, in Latin and English, of the Borer, proposing for it the name *Diatraea sacchari*. Guilding's description of the genus has been given in Part I of these Notes; that of the species follows:

"Diatraea sacchari

The Borer

"D. straminea, alis superioribus sordidè ochraceis, lineis duabus obliquis nigricantibus, disci atomo unico, marginis plurimis atris: alis inferioribus pedibusque argenteo-flavidis.

"D. straw-coloured, upper wings dirty ochre, with two blackish oblique lines, one black dot in the centre, and several on the margin: lower wings and feet pale yellow. Larva yellowish, spotted with black, rather hairy; head and neck ferrugineous; dorsal line yellowish; lateral spots livid; thoracic feet 6; abdominal 8; anal 2. Body much lengthened".

He proceeds to tell us:

"(But) by far the most destructive and common enemy is the..... grub of the moth, whose description is given above. The sugarcane, so valuable to man in all its parts, is never exempt from this dreaded pest. Fortunately, in the seasonable climate of St. Vincent, from our improved cultivation, the animal is not very formidable, but in some other of our colonies, which, from the absence of mountains, or other causes, are subject to dry seasons, they have been known to blast the hopes of the year, to destroy whole acres of canes, and ruin the unfortunate planter".

In 1833, J. O. Westwood mentioned *Diatraea sacchari* Guild., among other pests of the sugar-cane in the island of Grenada, and gave his opinion that it was identical with the *Phalaena saccharalis* of Fabricius, and in this he was followed by Kirby and Spence in the sixth edition of their *Introduction* (1843).

We find various references to *Diatraea sacchari* Guild. as a pest in the West Indian sugar plantations about this time, among which may be mentioned those of G. R. Porter (1843), already noticed; of the explorer and naturalist Sir Robert Schomburgk (1848); and of P. H. Gosse, philosopher and author of *Omphalos*, in his *Naturalist's Sojourn in Jamaica* (1851), which contains an account by R. Hill of the sugar-cane insects of that island.

At a meeting of the Linnaean Society held in London on 3rd June, 1856, Westwood announced that the island of Mauritius was suffering heavy losses from "the borers", which were, in his opinion, the same as those which had been described from the West Indies as *Phalaena saccharalis* by Fabricius and *Diatraea sacchari* by Guilding. This belief was shared by the French entomologist A. Guenée, but many years later (1895) it was shown by E.-L. Ragonot that both Westwood and Guenée were mistaken. Ragonot was indignant that his countryman could have entertained such an idea, and at a meeting of the *Société Entomologique de France* held at Paris on 8th May, 1895, he exhibited specimens from Mauritius side by side with some from the Antilles, and demonstrated the differences between them. Ragonot, however, erroneously identified the borer of Mauritius with *Diatraea striatalis*, described by P. C. T. Snellen from Java, where it also was a serious pest of sugar-cane.

In 1856, the year of Westwood's discourse in London, there appeared a *Report* on the Borer in the French island of Réunion by W. Bojer, who named the insect *Proceras sacchariphagus*. In 1862, Guenée described it independently, as *Borer saccharelus*, thereby creating yet further confusion, but fortunately we are not concerned with the identity of these sugar-cane borers of the Old World. They are now considered (Tams, 1942) to belong to a distinct genus, *Proceras* Bojer, whereas *Diatraea* Guild. is exclusively American.

A digression is now necessary, and to follow the history we must enter the realm of pure systematics. In the year 1863 there appeared the 27th part of the well-known *List of Lepidopterous Insects in the Collections of the British Museum*, in which that indefatigable systematist Francis Walker described, among numerous other moths, three species of Pyralidae which he considered to be new, viz. *Crambus leucaniellus*, from "St. Domingo", *C. lineosellus*, from "Honduras", and *C. impersonatellus*, from "Venezuela and Santarem" (Amazon River, Brazil). In this same year the German entomologist, P. C. Zeller, published a monograph on the Pyralid genera *Chilo* and *Crambus*, in which we find the description of *Chilo oblitteratellus*, from Brazil. In 1872, Zeller included in *oblitteratellus* a specimen from the Rio Magdalena, Colombia. He mentions other collections which had been made by von Herrich-Schäffer at Bogotá, and, although no food-plant was known of *oblitteratellus*, he proceeds to discuss the relation of this species with "*Pyralis (sic) saccharalis* Fabr. (*Crambus sacchari* Fabr.)" and with the sugarcane borers of Reunion described by Bojer and Guenée. In a further paper (1877), Zeller mentions various specimens of *oblitteratellus* in the Staudinger Museum, from "Chiriqui, Panama", "Nuevo Friburgo" (Brazil), and "Cuba". In 1881 he published a revision of the Colombian species of *Chilo* and allied genera, in which he discusses at length the nomenclature of the forms described in his earlier papers. He transferred *oblitteratellus* (and certain others) to *Diatraea* Guild., but failed to recognise the identity of this species with *D. sacchari* Guild. (= *Phalaena saccharalis* Fabr.). This synonymy, known to Westwood, was established independently by the Baron W. von Hedemann, in a little known but important paper on the Microlepidoptera of the Danish West Indian Islands (1894), and by Herbert Druce in the *Biologia Centrali-Americana* (1896), where we find two of Walker's species, *C. leucaniellus* and *C. lineosellus*, also sunk as synonyms of *Diatraea saccharalis* (Fabr.), the same treatment unfortunately also being meted to *Diatraea crambidoides* (Grote) which had recently (1880) been described (as *Chilo crambidoides* Grt.) from the U. S. A. Druce refers *Crambus impersonatellus* Walk. to the synonymy of *Diatraea*

neuricella (Zell.) (*Chilo neuricellus* Zell. 1863), which itself has since been shown to be a synonym of another, and very distinct, species, viz. *D. lineolata* (Walk.) (*Leucania lineolata* Walk. 1856), described from Venezuela and to be discussed in Part IV of these Notes. Sir George Hampson, then in charge of the Lepidoptera at the British Museum, published his own views on the synonymy in 1895. He sinks all three of Walker's species, as well as *Chilo oblitteratellus* Zell. and *Ch. crambidoides* Grote, into *Diatraea saccharalis* (Fabr.) The confusion in the literature can best be imagined, and it became necessary to clarify this nomenclatorial problem.

The types of Walker's species, and also that of Grote's, are in the British Museum, and the Tring Museum has a specimen of *oblitteratellus* Zell., labelled by R. Felder and referred to in the *Reise Novara*, and which is almost certainly Zeller's type. With this material it was possible for the writer to arrive at the following conclusions: (i) von Hedemann, Druce and Hampson were correct in synonymising *oblitteratellus* Zell. with *D. saccharalis* (Fabr.); (ii) all of the these authors were in error concerning *crambidoides* Grote; this is a distinct and valid species, as had been accepted by Fernald in his revision of North American *Diatraea* (1888) and it is of recognised economic importance as a pest of corn, and occasionally of sugar-cane, in the eastern U. S. A.*; (iii) all authors were correct in sinking *leucaniellus* and *lineosellus* into *saccharalis*, but incorrect in their conclusions respecting *impersonatellus*, which the writer was able to raise from synonymy to the rank of a valid species, now known as *Diatraea impersonatella* (Walk.), which will be discussed in Part IV of these Notes.

An observation is required in connection with *oblitteratellus* Zell. The British Museum possesses a long series of moths from the Zeller collection, including some collected by Peterson in Colombia, referred to by Zeller in his 1881 paper and bearing

* It should not be confused with *D. grandiosella* Dyar, the "South-western Corn Borer", which ranges through the south-western U. S. A. and Mexico.

labels in his ms.: "*Diatraea obliteratedella*" or "*Diathraea obliterateda*" (*sic*). Most of these, however, are not *saccharalis*, but are referable to *D. tabernella* (Dyar) *sensu* Dyar and Heinrich (1927) and Box (1931), and there is little doubt that Zeller's figure of the female *obliteratedellus* also represents *tabernella*, while that of the male is *saccharalis*.

We may now resume our history of the sugar-cane borer, and it is necessary to revert to the years 1879 and 1880, when the distinguished lady entomologist, Miss Eleanor Ormerod, announced before the *Entomological Society of London*, the serious losses suffered in the plantations of Demerara (British Guiana) because of the ravages of these insects. In 1879, W. S. d'Urban also refers to the borer in Demerara, stating that "specimens of the small shoots were forwarded to me which had been bored by the larvae of a moth, probably the *Phalaena saccharalis*, Fab. It has been called *Diatraea sacchari*, Guilding, and *Proceras saccharophagus* Bojer, at least it is probable that the same insect is meant by all these names". These appear to be the first actual references to the occurrence of this pest on the mainland of South America.*

The borer seems to have been accidentally introduced into the sugar plantations of Louisiana around 1850-1855, according to an article by J. B. Avequin (1857), but it was not until 1879 that it received serious attention in the United States. In that year, C. V. Riley, Chief Entomologist of the U. S. Department of Agriculture at Washington, issued a brief notice (which unfortunately contained many errors) announcing the appearance in Louisiana of "a sugar cane borer (*Diatraea sacchari* Gould) (*sic*), first mentioned as injurious in the island of Mauritius

* The *Phalaena sacchari* (*Noctua*) of Sepp (1848), described as a sugar-cane borer in Suriname (Dutch Guiana) is identified by the present writer as *Diatraea canella* Hamp.

The insects described by Walker and Zeller were museum specimens of moths collected probably at lights, and there is no indication, in their respective descriptions, of the plants in which their larvae feed, though Zeller undoubtedly suspected *obliteratedellus* to be associated with sugar-cane.

(sic) but not previously recorded as occurring in this country (sic)".

Two years later (1881) J. B. Comstock published his monumental report on the insect, now referred to for the first time as *Diatraea saccharalis* (Fabr.) describing its history, bionomics, the damage done by it, and recommendations for its control. In the second part of this report, Comstock describes the damage done by "The Cornstalk Borer" in South Carolina; he refers to this as *Diatraea saccharalis* (?) (Fabr.), explaining "in the present state of uncertainty we prefer to leave the species as *saccharalis*, with an interrogation". This cornstalk borer has since proven to be *Diatraea crambidoides* (Grote), and it appears to be endemic in the south-eastern U. S. A. The common sugarcane borer in Florida (which also attacks corn) is *D. saccharalis*, but its early history in that state is not known to the writer; it may be indigenous there.

An observation by that great American entomologist, L. O. Howard, written in 1891, is singularly pertinent at this stage of our history: "it seems altogether likely that in different parts of the world we have several distinct species of Crambidae uniting in the sugar-cane boring habit."

Before the close of the XIXth century, the literature concerning the sugar-cane moth borer, and particularly papers dealing with its aspects as a pest, had begun to accumulate on a fairly large scale, from practically all of the countries within its range, from the U. S. A. to the Argentine Republic.

Taxonomic work during the first three decades of the XXth century added many new names to the genus, but failed to clarify the nomenclature of the older species. In 1911, Dyar recognised varietal rank within *D. saccharalis*, and described *grenadensis* (type from Grenada) and *tabernella* (type from Panama) as new varieties. He placed *obliteratella* (Zell.) (Colombia) and *crambidoides* Grote also in this grade. In this paper, Dyar described *D. pedidocla* (type from Mexico) as a new species. Rosenfeld and Barber, in their bulletin on the Sugarcane Moth Borer in Tucumán, Argentina (1913-14), refer to the insect as *Diatraea saccharalis* Fab. var. *obliterallis* Zell. (sic.)

but give no reason for this choice of name. Two writers on the same pest in Brazil, van Gorkum and de Waal, proposed varietal rank for the borer in that country, naming it *Diatraea sacchari* (*sic*) var. *brasiliensis*.

Dyar and Heinrich, in their revision of *Diatraea* (1927), raised var. *tabernella* Dyar to specific rank, but sunk var. *grenadensis* Dyar, together with var. *obliteratellus* (Zell.) Dyar, and *D. pedidocla* Dyar, into the synonymy of *saccharalis*, and, most unfortunately, also *crambidoides* Grote. In this paper they describe *D. incomparella* (type from Amazons, Brazil) as a new species. The present writer confirmed (1931) the synonymy as described above, except that he raised *crambidoides* to permanent specific rank, and sunk *sacchari brasiliensis* van Gorkum & de Waal and *incomparella* Dyar & Heinr., into *saccharalis*. His paper, however, contained certain errors which were later (1935) corrected, and it may therefore be convenient to present a revised summary of the synonymy of the genotype, as follows:

DIATRAEA SACCHARALIS (Fabricius)

Phalaena saccharalis Fabricius 1794, Skrift. af Naturh.-Selsk. (Copenhagen), iii (2): 64, pl. vii, fig. 1.

Crambus sacchari Fabricius 1798, Suppl. Ent. Syst.: 469.

Diatraea sacchari Guelding 1828, Trans. Soc. Encour. Arts, etc., xvi: 149, 1 pl., 11 figs.

Crambus leucaniellus Walker 1863, List Lep. Ins. Brit. Mus., xxvii: 161.

Crambus lineosellus Walker 1863, List Lep. Ins. Brit. Mus., xxvii: 162.

Chilo obliteratellus Zeller 1863, Chilonid. et Crambid. gen. et spp.: 8.

Diatraea obliteratella (Zell.) Zeller 1881, Hor. Soc. Ent. Ross., xvi: 163, t. xi, fig. 5 a., male (fig. 5 b, female = *D. tabernella* Dyar).

Diatraea saccharalis (Fabr.) Comstock 1881, U.S. Dep. Agr. Entom. Rept. 1880: 240. (Not *D. saccharalis* (?) (Fabr.) Comst., l. c.: 243 = *D. crambidoides* (Grote)).

Diatraea saccharalis saccharalis (Fabr.) Dyar 1911, Ent. News, xxii: 199.

Diatraea saccharalis grenadensis Dyar 1911, Ent. News, xxii: 200.

Diatraea saccharalis obliteratella (Zell.) Dyar 1911, Ent. News, xxii: 200.

Diatraea saccharalis crambidoides (Grt.) Dyar 1911, Ent. News, xxii: 200; et auctt. [Not *Chilo crambidoides* Grote 1880, Canad. Ent., xii: 15, = *D. crambidoides* (Grote)].

Diatraea pedidocla Dyar 1911, Ent. News, xxii: 201.

Diatraea sacchari brasiliensis van Gorkum & de Waal 1913, Bol. Est. Exp. de Canna de Assucar de Escada (Recife), i: 181.

Diatraea incomparella Dyar & Heinrich 1927, Proc. U. S. Nat. Mus., lxxi, n° 2691: 13.

So far as the more practical aspects of the problem are concerned, the advances made during the XXth century are considerable, and much valuable original work has been done by entomologists in several countries, notably Argentina, the United States and Cuba, in elucidating the details of the life-history, and estimating the amount of damage caused by the borer. The scientific study of the ecology of *Diatraea saccharalis*, and particularly of its inter-relations with its various natural enemies in its different foodplants, is entirely a modern development, due almost entirely to the work of the late J. G. Myers, and has led to a few instances of complete dominance of the pest by means of Biological Control, the only proven method of combating it. But considering the problem as a whole, *Diatraea saccharalis* is still the most widely distributed and serious enemy of sugar-cane cultivation in the New World, although, due to improvements in cultivation methods, the production of new and more resistant varieties of sugar-cane, and the modernization of sugar manufacturing processes, its effects are rather less spectacular than in the old days. Nevertheless, it would be no exaggeration to apply to this insect today the words of von Hedemann, written more than fifty years ago: "Die Raup.... den Zuckerrohr noch ebenso verderblich, wie su Fabricius'Zeit".*

* "This caterpillar is still as harmful to sugar-cane as it was in the days of Fabricius".



The Geographical Range of *Diatraea saccharalis* (Fabr.)

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FAUNA CULICINA DE VENEZUELA
DESCRIPCION DE CINCO NUEVAS ESPECIES

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Se describen cinco especies nuevas de culícidos, una de la colección del Dr. O. Hecht y cuatro obtenidas en trampas de luz. Por la condición en que se encuentran los ejemplares solo es posible hacer las descripciones de sus genitales.



Fig. 1.—Pieza lateral.

Fig. 2.—Lóbulos de la novena tergita.

Fig. 3.—Placa del mesosoma.

Culex (Melanoconion) pifanoi sp. nov.

(Figs. 1-3)

Clasper corto, grueso, amplio en la base con constrictura en la parte mediana; "cabeza" alargada con apéndice linguiforme y cresta de cerdas. Pieza lateral globular revestida de micro-

trichia y cerdas largas. División externa del lóbulo formada por una columna con tres protuberancias; la mas cercana a la pieza lateral casi aplastada con tres filamentos lanceolados largos; la segunda con dos filamentos uno de los cuales tiene forma de garfio, el otro lanceolado; la tercera tiene una espina gruesa y larga con ápice en forma de garfio y un filamento lanceolado. Lóbulo interno bifurcado pero no separado, uno más corto que el otro (exterior) con fuertes y gruesas espinas en el ápice de cada bifurcación. Lóbulos de la novena tergita casi triangular, con dos grupos de cerdas medianamente largas, uno de muchas cerdas en la parte apical y hacia los bordes internos, el otro de pocas cerdas en la base. Décima esternita recta y delgada con, ápice pectinado. Placa del mesosoma con tres picos en el ápice, dos grandes, el otro pequeño, todos con la misma orientación; uno de los bordes laterales liso, el opuesto sinuoso; apéndice de la placa relativamente grueso y angular cuando se compara con los de las demás especies.

Tipo: genitales de un macho montado en bálsamo en la colección del autor.

Paratipo: genitales de un macho montado en bálsamo en la colección del U. S. N. M., Washington, D. C.

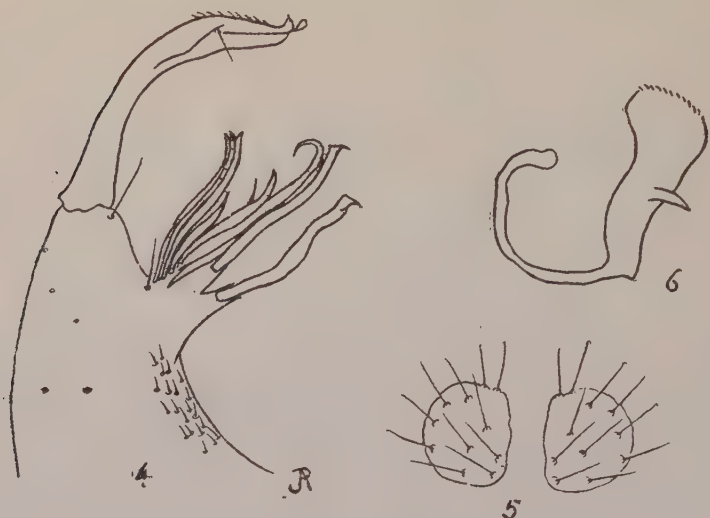
Localidad tipo: Caripito, Edo. Monagas, Venezuela. (Anduze, col.) Agosto de 1947.

Esta especie está dedicada al Dr. Félix Pifano C., Profesor de Patología Tropical, Universidad Central de Venezuela.

Culex (Melanoconion) vogelsangi sp. nov.

(Figs. 4 - 6)

Clasper corto relativamente grueso, ensanchado en la base con constricción en la parte media; "cabeza" alargada, ápice retorcido con apéndice linguiforme. Cresta de cerdas cortas y tubérculo setífero en la parte mediana. Pieza lateral piriforme alargada, revestida de cerdas largas y cortas y una mancha de espinitas en la base interna de la división interna del lóbulo de la pieza. División externa como columna inclinada con siete filamentos de tamaño y grueso variable, tres de estos filamentos están cerca de la base de la columna, el más largo termina en terna en columna gruesa, bifurcada con brazos iguales cada uno forma de garfio, está en el ápice de la columna. División in-



Culex (Melanoconion) vogelsangi sp. nov.

(Figs. 4-6)

Fig. 4.—Pieza lateral.

Fig. 5.—Lóbulos de la novena tergita.

Fig. 6.—Placa del mesosoma.

con una espina larga, gruesa, de ápices torcidos. Lóbulos de la novena tergita globosos, pequeños con doce tubérculos setíferos las cerdas relativamente largas y rectas. Décima esternita larga y recta con ápice pectiniforme. Placa del mesosoma relativamente sencilla, redondeada en el ápice aserrado, borde interno redondeado, borde externo cóncavo con una protuberancia aguda en la parte mediana.

Tipo: genitales de un macho montado en bálsamo en la colección del autor.

Localidad tipo: Caripito, Edo. Monagas, Venezuela. (Anduze, col.) Agosto de 1947.

Esta especie está dedicada al Comandante Dr. E. G. Vogel-sang, Decano de la Facultad de Medicina Veterinaria.

*Culex (Melanoconion) ernsti* sp. nov.

(Figs. 7-9)

Fig. 7.—Pieza lateral.

Fig. 8.—Lóbulos de la novena tergita.

Fig. 9.—Placa del mesosoma.

Clasper corto, ensanchado en la base, con constrictura mediana; "cabeza" ancha con ápice recto y apendice linguiforme grande. Cresta de cerdas y tubérculo setífero. Pieza lateral piriforme revestido de cerdas largas y cortas y una pequeña mancha de espinas cortas en la base interna de la división interna del lóbulo de la pieza. División externa prominente como columna inclinada ornamentada de seis filamentos lanceolados en escala ascendente hasta el ápice. En el tercio apical, por debajo del cuarto filamento hay un tubérculo setífero y del mismo tamaño hay otro en la base de la columna. La división interna del lóbulo está ampliamente bifurcada el brazo interno más corto que el externo, este termina en una fuerte espina de ápice torcido así como también el brazo externo pero el ápice de la espina no ostenta el garfio de la espina interna. Lóbulos de la novena tergita elípticos con fuertes cerdas de la parte mediana interna hacia el ápice y espinitas en los polos basales. Décima

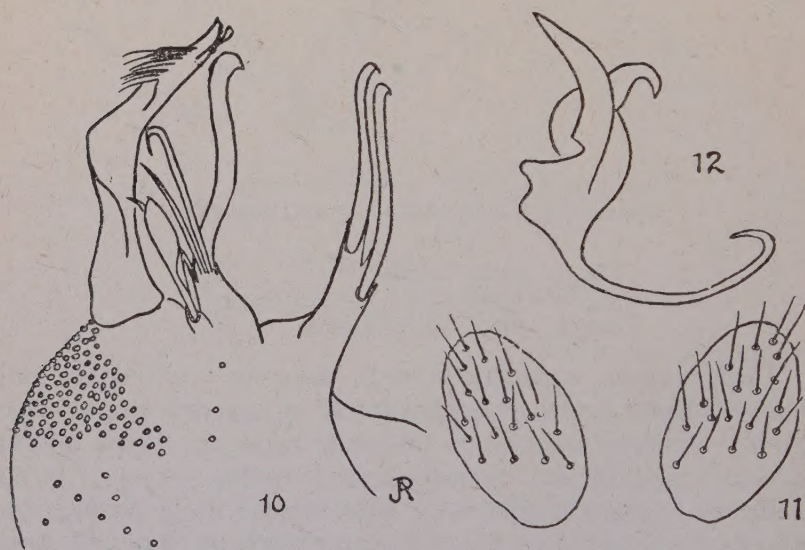
esternita larga, recta con ápice pectinado. Placa del mesosoma de ápice aserrado, un borde lateral sinuoso con protuberancia aguda en el cuarto apical, borde opuesto más liso con protuberancia en la parte mediana.

Tipo: genitales de un macho montado en bálsamo en la colección del autor.

Paratipo: genitales de un macho en la colección del U. S. N. M., Washington, D. C.

Localidad tipo: Caripito, Edo. Monagas, Venezuela. (Anduze, col.) Agosto de 1947.

Se dedica esta especie a la memoria del Dr. A. Ernst, propulsor de las Ciencias Naturales en Venezuela.



Culex (Melanoconion) venezuelensis sp. nov.
(Figs. 10-12)

Fig. 10.—Pieza lateral.

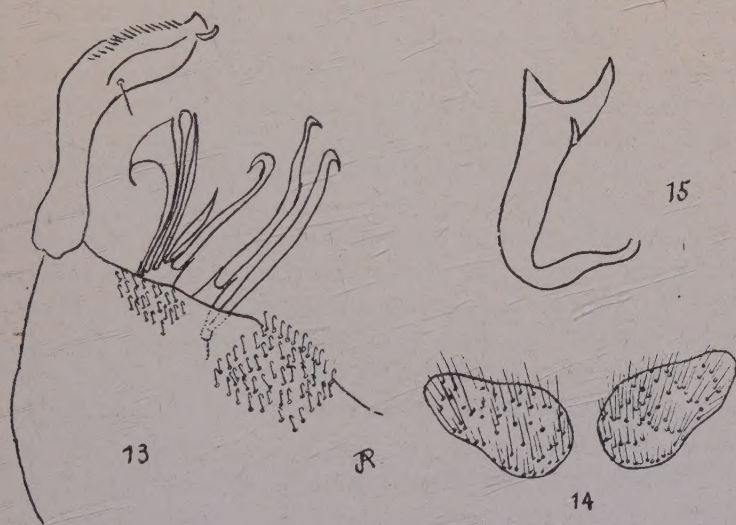
Fig. 11.—Lóbulos de la novena tergita.

Fig. 12.—Placa del mesosoma.

Clasper corto, grueso, angular, adelgazado en la "cabeza" con apéndice linguiforme pequeño. Cresta espesa. Pieza lateral muy globular con revestimiento de cerdas muy largas particularmente una gran agrupación de estas en el borde externo

próxima a la base del clasper. División externa del lóbulo prominente teniendo en el ápice una fuerte y gruesa espina sinuosa, dos filamentos delgados y otro más largo con apéndice curvo. En la base de la columna hay una protuberancia que culmina en un apéndice foliforme. La división interna del lóbulo diverge ampliamente de la división externa, tiene forma de columna prominente con apenas una bifurcación apical de cuyos brazos nacen dos fuertes y gruesas espinas de puntas curvas. Lóbulos de la novena tergita oval alargados con abundantes tubérculos setíferos, las cerdas relativamente largas. Placa del mesosoma con ápice bifurcado, los brazos puntiagudos divergentes, un borde sinuoso con protuberancia mediana, el opuesto convexo y liso.

Tipo: genitales de un macho montado en bálsamo en la colección del autor.



Culex (Melanoconion) terepaima sp. nov.

(Figs. 13-15)

Fig. 13.—Pieza lateral.

Fig. 14.—Lóbulos de la novena tergita.

Fig. 15.—Placa del mesosoma.

Localidad tipo: Caripito, Edo. Monagas, Venezuela. (Anduze, col.) Agosto de 1947.

La forma globular de las piezas laterales de esta especie dificultan el montaje por lo que hay cierto grado de distorsión. Sin embargo, es tan notable la morfología genital de este culicino que difícilmente podrá confundirse con otro.

Clasper muy corto, grueso y ensanchado en la "cabeza". Tiene apéndice linguiforme delgado, tubérculo setífero mediano y cresta de cerdas. Pieza lateral piriforme globular pilosa con dos grupos de pequeñas espinas falciformes, uno en la base y lateral de la división externa del lóbulo de la pieza, y otro mayor en la base interna de la división interna del lóbulo de la pieza. Todas las cerdas salen de pequeños tubérculos. La división externa tiene forma de columna inclinada adelgazada en el ápice, está ornamentada desde la base en forma ascendente primero por un filamento vexiliforme, seguido de otro filamento de igual largo con ápice redondeado luego por dos filamentos lanceolados, el primero más largo y delgado que el otro y culmina en un filamento largo, delgado de ápice en forma de garfio. La división interna del lóbulo es también en forma de columna, no tiene bifurcación aparente aunque ostente las dos espinas fuertes de puntas curvas que comunmente se ven en las especies del género. Una de estas espinas (la interna) nace cerca de la base de la columna mientras que la externa sale del ápice. Los lóbulos de la novena tergita son piriformes densamente revestidos de tubérculos setíferos; las cerdas relativamente finas. Placa del mesosoma simple con ápice bifurcado en puntas agudas con un proceso agudo en el tercio apical lateralmente.

Tipo: genitales de un macho montado en bálsamo en la colección del autor.

Localidad tipo: El Valle, D. F. (Dr. O. Hecht, col.)

Nota. Todos los genitales que motivan estas descripciones fueron comparados personalmente con el material existente en el U. S. National Museum de Washington. Agradezco la fina cortesía de los Dres. Alan Stone y W. H. W. Komp, quienes los examinaron conmigo y quienes convinieron que se trataba de especies nuevas para la ciencia.